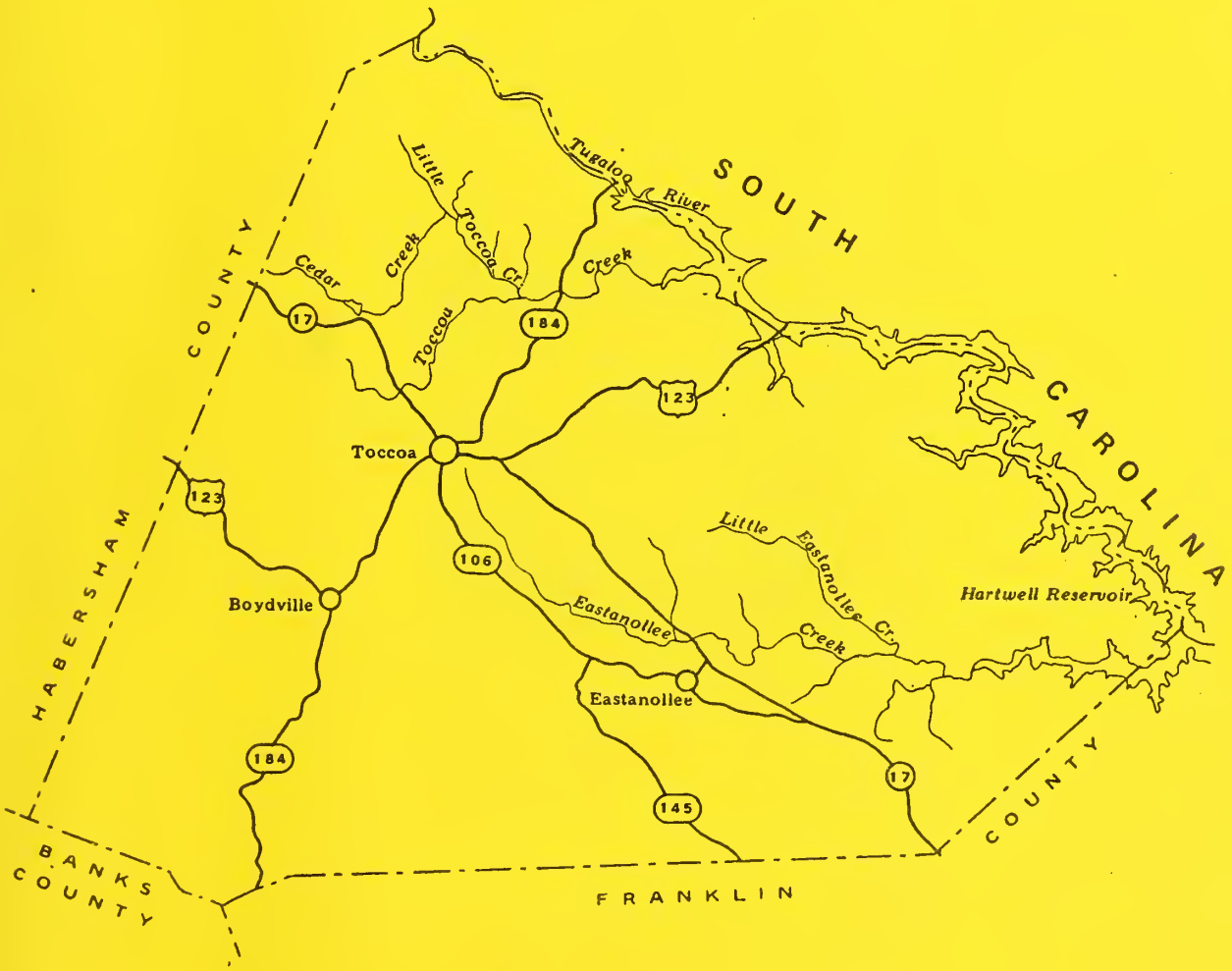
FLOOD PLAIN MANAGEMENT STUDY

OF

TOCCOA AND EASTANOLLEE CREEKS

STEPHENS COUNTY, GEORGIA



SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE

DECEMBER 1981

FLOOD PLAIN MANAGEMENT STUDY

of

TOCCOA AND EASTANOLLEE CREEKS

STEPHENS COUNTY, GEORGIA

Prepared Under A
Joint Coordination Agreement

With

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

By

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Athens, Georgia

In Cooperation With

STEPHENS COUNTY
and
BROAD RIVER SOIL AND WATER CONSERVATION DISTRICT

December 1981

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Introduction

The Toccoa Falls disaster of November 6, 1977, which killed 39 people and caused enormous property losses, resulted from a dam failure which occurred during a storm condition. The dam was located on Toccoa Creek, and all of the losses occurred in Toccoa Creek valley. This event stimulated local officials to seek public assistance in disaster relief and flood protection. Subsequently, a task force of local, state, and federal officials was formed to study these problems and provide the city of Toccoa and Stephens County with a development strategy for dealing with such problems in the future. The resulting task force report indicated the need for identifying flood hazard areas throughout the county. As a result, the Stephens County Board of Commissioners has officially requested assistance from the Soil Conservation Service (SCS) in making a flood plain management study (FPMS) on Toccoa and Eastanollee Creeks.

The county commission is interested in providing for orderly expansion, regulated future growth, and avoidance of future catastrophies. These local officials propose to use the study results as a basis for implementation of a flood plain management program.

The Georgia Department of Natural Resources (DNR) processed the Stephens County request for assistance and coordinated the study. The latest Joint Coordination Agreement between DNR and SCS was executed in March 1981. Stephens County requested the study in July 1977, and provided aid throughout, including aerial photography, assistance in field surveys, and public information. The Broad River Soil and Water Conservation District cosponsored the study and assisted with public information. The Corps of Engineers has reviewed the flood profiles for a portion of Toccoa Creek, an area previously studied by them.

SCS assists State agencies and communities in the development and implementation of their flood plain management programs by carrying out cooperative FPMS under authority of Section 6 of Public Law 83-566. Studies are made in accordance with Executive Order 11988 and Federal Level Recommendation 3 of "A Unified National Program for Flood Plain Management."

Field surveys of valley cross sections and road crossings represent conditions as of April 1981. Peak discharges were computed using a frequency analysis of the stream flow at the U.S. Geological Survey gaging station on Panther Creek near Toccoa. Flood profiles have been computed using the SCS WSP-2 computer program.

Study Area Description

Toccoa Creek and its tributaries drain the northern part of Stephens County. The upper portion of the drainage area lies on the south slope of the Blue Ridge foothills with very steep slopes. Total drainage area is approximately 30 square miles and includes a significant area of the Chattahoochee National Forest. Urban areas are located on the north side of Toccoa, and the Toccoa water supply reservoir is situated on Cedar Creek.

Eastanollee Creek has a drainage area of approximately 25 square miles and lies in the southeastern part of the county. (See Location Map.) This area is in the upper Piedmont Plateau and is less sloping than Toccoa Creek. Eastanollee Creek heads within the Toccoa city limits, and much of the urban area is located in the upper portions of this drainage area. The remaining part of the drainage area is rural, with the land use being agriculture and forestry. Future growth is projected to be significant in this area.

These streams are tributaries of the Tugaloo River which lies within the Savannah River Basin and Hydrologic Unit No. 03060102 of the 1974 USGS Hydrologic Map. The study includes all significant flood-prone lands within these drainage areas. Study lengths are listed in Table 1 and identified on the Photomap Index.

TABLE 1 - Study Length of Streams

Tributary	Length (Miles)
Toccoa Creek	7.5
Little Toccoa Creek	2.2
Cedar Creek	0.5
Eastanollee Creek	11.4
Little Eastanollee Creek	2.9
Ogg's Branch	1.6
Tributary A	0.1
Total	26.2

The upper drainage areas of Toccoa Creek are in the Blue Ridge foothills. Predominant soils are of the Pacolet-Wedowee-Chandler Association, and are sloping to very steep. Most of this area has never been cleared. Two other soil associations (Pacolet-Louisburg-Appling and Madison-Pacolet-Gwinnett) make up most of the remaining drainage area. These soils, also, range from sloping to very steep with some slopes up to 60 percent.

The upper half of Eastanollee Creek drainage area is largely characterized by the Pacolet-Louisburg-Appling Association, mainly steep, well-drained soils. Almost all of this association is in trees. Soils of the Cecil-Hiwassee-Madison Association are predominant in the lower half of the

drainage area. These soils are well-drained, gently sloping with slopes from 2 to 10 percent. These are some of the better soils for farming in the county. Most of the remainder of the lower half of the Eastanollee Creek drainage area falls into the Madison-Hiwassee-Pacolet Association. These soils have been extensively cleared for cultivation, but about half of this formerly cleared acreage has reverted to mixed woodland.

The mean annual temperature is 61 degrees F, varying from a mean of 44 degrees in January to 78 degrees in July. Temperatures are 90 degrees or more less than half the days during June, July, and August. A temperature of 100 degrees or more occurs only once in 3 years; 32 degrees or less occurs about 50 times during an average winter. The average frost-free season is about 210 days. Precipitation averages 58.6 inches annually and varies from 3.5 inches in September to 6.8 inches in March.

Natural Values

Area of study deals with Toccoa Creek, Little Toccoa Creek, Eastanollee Creek, Little Eastanollee Creek, and Cedar Creek (excluding portion on U.S. Forest Service land) in Stephens County, Georgia. Toccoa Falls and Toccoa water supply are the upper limits of the study, with the lower limits being the confluence of Toccoa and Eastanollee Creeks with Lake Hartwell. Much of this area is on the dividing line between the foothills and upper Piedmont which produces steep, rough terrain. The creeks are characterized by having a steep, rocky appearance with many riffles and rapids. Flood plains that have not been altered for agriculture or urban use support a productive, diverse biota adapted to alternating high and low water flows. Additionally, flood plains provide areas where floodwaters can spread out and be temporarily stored. This reduces flood peaks and velocities and the potential for erosion. Flood plains serve to maintain water quality in streams and reservoirs. A vegetated flood plain slows surface runoff, causing it to drop most of its sediment load on the flood plain. Vegetation also filters incoming floodwaters. Much of the sediment originating on the land drops out, as well as some of that scoured from the channel banks and bed. This filtering process may add nutrients to the flood plain soil. However, excess nutrients entering the stream in runoff can accelerate eutrophication in downstream reservoirs. Natural flood plains have surface conditions favoring local ponding and flood detention, plus subsurface conditions favoring infiltration and storage. Flood plains thus serve an important role in ground water recharge.

Little Toccoa Creek Watershed, which includes Cedar Creek, is classified as secondary trout waters. Remaining streams in the study area support redeye bass (Micropferus coosae) and red-breasted sunfish (Lepomis microlophus).

Upland areas will not be addressed except where they are part of, or adjacent to, the flood plain or stream. Areas that have been noted within the study of importance are the bluff and ravine forests of northern affinities lying along the Gainesville ridges within the Brevard Fault zone of the Piedmont. These are mesic broadleaf deciduous forests that occur along streams with steep slopes facing north. Another is Toccoa Falls which is recognized as one of the outstanding natural areas of the Savannah River Basin. A unique area worthy of mention is a gorge along Cedar Creek containing virgin timber and many rare plant species.

Endangered and threatened plants and animals that may occur are as follows: Pink lady's slipper (Cypripedium acaule), yellow lady's slipper (Cypripedium calceolus), purple cone flower (Echinacea laevigata), nestronia (Nestronia umbellula), bay star vine (Schisandra glabra), barren strawberry (Waldsteinia lobata), mountain-lion (Felis concolor), and Indiana bat (Myotis sodalis).

Potential habitat for these occurs along most of the streams in the study except for the developed areas.* Bluffs and gorges adjacent to the streams afford the best opportunities for their presence. Specific areas in which additional studies should be made for endangered and threatened species, as well as unique plant and animal communities, are between the following cross sections: 104 to 100; 3 to Lake Hartwell; 12A-9C 49-44; (61A) right side looking downstream from Toccoa Falls to 56; 41-40; 79 to just above 70. Also, these areas have a potential for outdoor classroom and protection of diverse plant and animal communities.

Most of the undeveloped flood plain of the study is Type 1 seasonally flood-basis wetland. There are small areas (less than 5 acres) of Type 2 and 3 wetlands throughout the study area, inland fresh meadows and inland shallow fresh marshes, respectively. Examples are located at cross section 21B (connection Eastanollee and Toccoa Creeks), Lake Hartwell, Cedar Creek below Black Mountain Road in pasture (cross section 91), and below cross section 51. These "spots" have rushes, sedges, cattails, some scattered alders, willows, and red maple. Areas of Type 6 swamp shrub occur in the upper end of Lake Hartwell.

About 75 percent of the county is in forest. The agricultural and urban land uses are on the flatter slopes and flood plains. Some 30 percent of the flood plain is used for agriculture, urban, and industrial purposes. There are some 600 acres of prime farmland, most of which occur in small, colluvial areas in depressions and at the head of drains throughout the county. Only about 6 acres of prime farmland are within the 500-year flood zone. These are located near the Toccoa Creek Sewage Treatment Plant (cross section No. 49).

Although there are no recorded archaeological or historic sites, the potential does exist for prehistoric activities along the flood plains. Investigations to identify presently unknown archaeological and historic sites should be considered a part of any land use planning.

* "Developed" refers to urban developed land: houses, roads, industry, sewage treatment plants, etc.

Flood Problems

The most damaging flood of record in Stephens County occurred in November 1977. Although the storm which caused this flood was only about a 5-year frequency event, the effects on Toccoa Creek, particularly at Toccoa Falls College, were devastating because of the Kelly Barnes Dam failure. A catastrophe of this nature is not expected to occur again; therefore, damages along Toccoa Creek from this event are not representative of those to be expected in the future.

The second most severe flood of recent times occurred in May 1976. This flood was estimated to be a 25-year frequency event. Damages on Eastanollee Creek were estimated to be $126,000, with $25,000 of this amount being agricultural damages. Total damages on Toccoa Creek were estimated to be $45,000; nearly all were nonagricultural.

The greatest single problem identified in the nonagricultural category is on Eastanollee Creek at the Toccoa Housing Authority complex. Apartments, offices, and warehouses are subject to flooding. Other nonagricultural damages include waste treatment facilities, roads, bridges, and culverts. Agricultural damages consist of losses of crops, pasture, and hay; sediment and scour damages; fence damage; and disruption of conservation measures.

Flood hazard areas are shown on the photomaps presented in this report. Photographs used for these maps were made in December 1978. The photomaps show the 100-year and 500-year flood hazard areas and the locations of the surveyed cross sections. Flood hazard areas for various frequency floods are given in Table 2. This table reflects current land use.

TABLE 2 - Flood Hazard Areas

	Acres Flooded					
	100-Year			500-Year		
Stream	Rural	Urban	Total	Rural	Urban	Total
Eastanollee Creek and Tributary A	383	172	555	502	226	728
Little Eastanollee Creek	104	0	104	145	0	145
Oggs Branch	33	0	33	45	0	45
Toccoa Creek	269	59	328	344	83	427
Little Toccoa Creek	100	0	100	118	0	118
Cedar Creek	45	0	45	55	0	55
Totals	934	231	1,165	1,209	309	1,518

An inventory of properties within the 100-year flood plain discloses 15 residences, 7 commercial/industrial structures, and 1 sewage treatment facility (oxidation pond).

Flood profiles for the 10-year, 50-year, 100-year, and 500-year floods are presented in Appendix A. Also shown are the locations of cross sections and road crossings.

To determine the flood hazard at a specific site, the following procedure is suggested:

1. Locate the site on the appropriate photomap sheet.

2. Scale the distance from the site to the nearest cross section.

3. Locate the cross section on the appropriate flood profile sheet (Appendix A); then plot the site the appropriate distance from the cross section. Flood elevations at the site can now be read from the flood profiles.

The on-ground mean sea level (MSL) elevation of the site should be determined by an acceptable survey procedure. Elevation reference marks (bench marks) are shown on the photomaps and are described in Appendix E.

Existing Flood Plain Management

Flood plains have been considered in land use planning in several instances in Toccoa and Stephens County. In addition, Stephens County adopted three resolutions in February 1975 which specify that attempts should be made to minimize damage from floods to buildings, subdivision plans, and sewage and water supplies. This ordinance complies with the demands of the Federal Insurance Administration (FIA) criteria (Section 1910) of the National Flood Insurance Program. The city of Toccoa enacted resolutions to their building code in May 1975 which were patterned after the ones for Stephens County. Both the city and the county have FIA flood hazard boundary maps at the present time. These maps are of a general nature, and their use is in specific regard to federally subsidized construction.

Stephens County and the city of Toccoa have adequate sediment and erosion control ordinances. Any major land-disturbing activity will have to receive a permit. Permits are not issued until an adequate erosion control plan is designed by the developer. These plans are to be reviewed by the Broad River Soil and Water Conservation District for technical feasibility and concurrence with accepted erosion control standards. An adequate erosion and sediment control plan is a necessity for sound land development. Procedures for carrying out the ordinance comply with provisions of the Georgia Erosion and Sedimentation Act of 1975.

Both city and county have subdivision regulations that control, in a general sense, the design and layout of housing developments. These ordinances are heavily dependent on design engineering factors and pay cursory attention to natural resource based factors.

Flood Plain Management Alternatives

Several alternatives have been considered which would have varying impacts on future flood problems.

Maintain Present Condition - The present condition, with existing development and the chance for future development within the flood hazard areas, could lead to intensified flood problems. Properties presently located in the flood plain will continue to be flooded. Intensity and frequency of flooding may increase due to increased runoff from uplands undergoing the land use changes of urbanization. New developments may occur in the flood plain and, of course, be subject to flooding.

Nonstructural Measures - There are several management alternatives which should be considered in order to alleviate the impact of existing flooding, and to reduce susceptibility to future flooding. Most likely a combination of alternatives will be necessary to achieve the desired results.

Land use regulations can be used to effectively reduce future susceptibility. By providing direction to growth and change, regulations are well suited to preventing unwise flood plain occupancy. Wise land use should also be applied to areas other than flood plains. Increased rates of runoff caused by impervious surfaces such as parking lots, roofs, and streets will cause more frequent and severe flooding in the upper Eastanollee Creek flood plain. Consideration should be given to measures designed to reduce or delay runoff. (Examples of such measures may be found in reference source 7.)

Participation in the National Flood Insurance Program would afford financial relief to owners of those properties already in flood prone areas. Under the Regular Program, property owners may buy flood insurance at reasonable cost. In return, the community carries out local flood plain management measures to protect lives and new construction from future flooding.

The sponsors may elect to adopt a floodway ordinance. (Refer to Floodway Determination section.) This would allow development in the fringe areas, but would require restrictions to development in the floodway. Adverse impacts of encroachments in the fringe areas such as increased flooding downstream, higher and more frequent flooding causing increased damage to existing structures, and deterioration of natural values must be considered.

A flood warning system may be considered for the Morgan Street area on Eastanollee Creek. This, in conjunction with an evacuation plan for inhabitants, may be an acceptable alternative for this area.

Floodproofing can provide for development in lower risk flood plain areas by keeping damage within acceptable limits. Floodproofing can be chosen by an individual or government for existing structures as well as

new construction. Means of floodproofing include raising the site elevation by filling, diking, and waterproofing.

Preservation of Natural Values - Serious consideration should be given to preservation of wetlands, unique areas, undeveloped flood plain, and bluffs adjacent to the streams which have high values for education, recreation, natural water treatment, ground water recharge, and moderation of floods.

The flood plain moderates flooding by providing an area where floodwater can spread out and be temporarily stored. Vegetated flood plains slow the rate at which incoming overland flow reaches the channel. Such practices as clearing, compacting, paving, filling, and building within the flood plain can cause increased flood elevations and frequencies. The adverse impact of this increased flooding must be considered. By maintaining the natural floodwater carrying capacity of the flood plain, many future flood problems may be avoided.

Also, encouragement of stream corridors or greenbelts along both sides of these creeks, particularly areas used for urban, pasture, and crops, will help reduce sediment load in Lake Hartwell. This greenbelt or stream corridor should be 50 to 100 feet wide landward from the top of each streambank. This would maintain riparian vegetation, prevent bank erosion and collapse, avoid accelerated sedimentation of the creeks and Lake Hartwell, and maintain habitats for living resources--particularly fish and wildlife.

Structural Measures - A preliminary investigation by SCS of the P.L. 566 Tugalo Watershed identified several floodwater retarding structures in this FPMS area. These structures would give a degree of flood protection to some areas, but would not provide protection from the 100-year flood. The benefit-cost ratio for the structural measures was unfavorable. Reference source 8 may be consulted for more specific information on these structures.

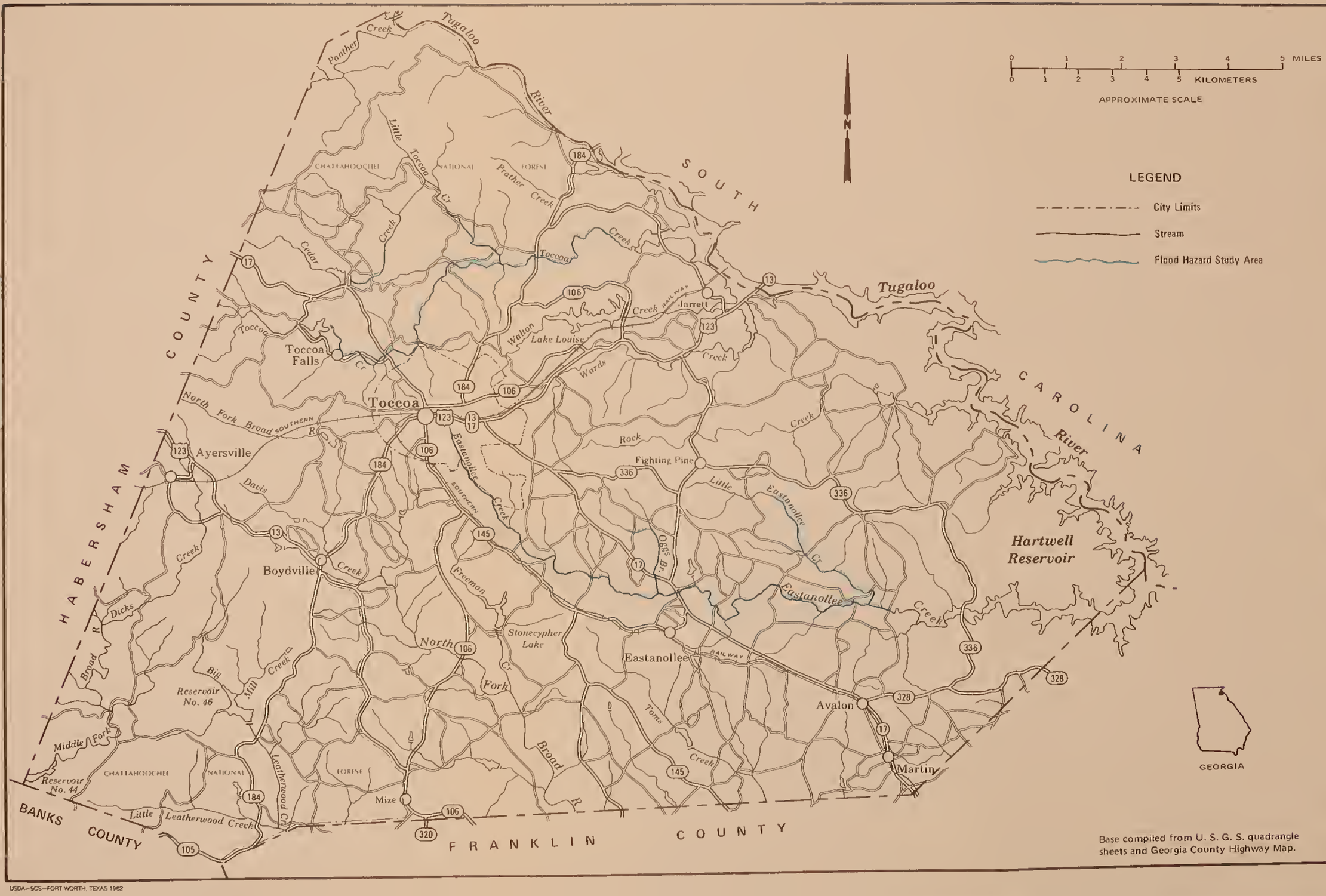
A number of road crossings have been modified in the past 3 years. Similar modifications may be useful at several other road crossings to alleviate the localized flood problems attributed to these crossings. Channel enlargement and placement of rock riprap on the banks could be utilized to reduce magnitude and frequency of some localized flood problems.

Floodway Determination

The floodway consists of the stream channel plus any adjacent flood plain areas that must be kept free from encroachment so that the 100-year flood can be carried without substantial increases in flood heights. The Federal Insurance Administration (FIA) has limited this increase to a maximum of 1 foot. The flood plain not within the floodway is called the fringe area. Theoretical floodways have been computed and are tabulated for selected cross sections in Appendix B. Should the sponsors decide to designate actual floodways, the floodway widths in Appendix B would be the minimum widths permitted so as not to exceed the 1-foot increase in the 100-year flood elevation.

LOCATION MAP

TOCCOA AND EASTANOLLEE CREEKS AND TRIBUTARIES



Base compiled from U. S. G. S. quadrangle sheets and Georgia County Highway Map.

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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

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USDA—SCS—FORT WORTH, TEXAS 1982

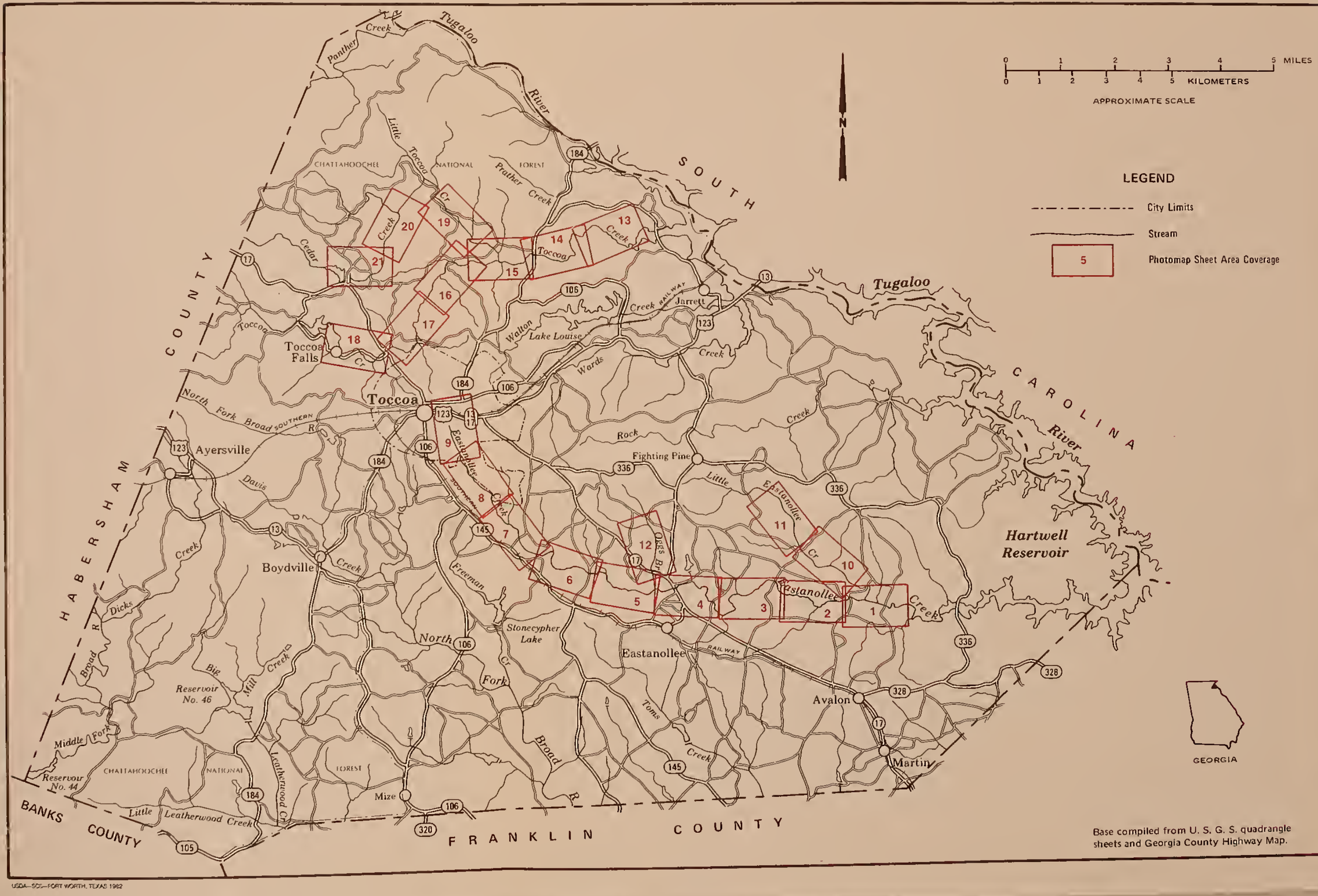
PHOTOMAP INDEX

AND

FLOOD HAZARD AREA PHOTOMAPS

PHOTOMAP INDEX

TOCCOA AND EASTANOLLEE CREEKS AND TRIBUTARIES



Base compiled from U. S. G. S. quadrangle sheets and Georgia County Highway Map.

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TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

SHEET 1 OF 1

USDA—SCS—FORT WORTH, TEXAS 1962

LEGEND

X Elevation Reference Marks

2 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
Park Aerial Surveys Inc. 12-6-78

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FLOOD PLAIN MANAGEMENT STUDY
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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA—SCS—FORT WORTH TEXAS 1982

LEGEND

X	Elevation Reference Marks	6A	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA—SCS—FORT WORTH TEXAS 1982

STUDY LIMIT

STUDY LIMIT

9C

9C BM 36

9B

Hayes Road

9

PBM 26

LEGEND

X	Elevation Reference Marks	9C	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

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400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

LEGEND

X Elevation Reference Marks

12 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

LEGEND

X	Elevation Reference Marks	18	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA-SCS—FORT WORTH, TEXAS 1942

STUDY LI

20

PBM 33
X

19

Elas Nollee

PBM 47

Meadow Brook Drive

LEGEND

X Elevation Reference Marks

19 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA—SCS—FORT WORTH TEXAS 1982

LEGEND

X	Elevation Reference Marks	24	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA-SCS-FORT WORTH, TEXAS 1982

LEGEND

X Elevation Reference Marks

26 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

EASTANOLLEE CREEK

USDA—SCS—FORT WORTH, TEXAS 1982

LEGEND

X	Elevation Reference Marks	31	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

EASTANOLLEE CREEK

LEGEND

X Elevation Reference Marks

104 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
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FLOOD HAZARD AREA

LITTLE EASTANOLLEE CREEK

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USDA—SCS—FORT WORTH, TEXAS 1982

LEGEND

X Elevation Reference Marks

108 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

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400 0 400
Scale in Feet

100 0 100
Scale in Meters

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TOCCOA AND EASTANOLLEE CREEKS
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FLOOD HAZARD AREA

LITTLE EASTANOLLEE CREEK

LEGEND

X	Elevation Reference Marks	113	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD HAZARD AREA

OGGS BRANCH

LEGEND

X Elevation Reference Marks

40 A Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

SHEET 13 OF 21

USDA—SCS—FORT WORTH, TEXAS 1982

1SDA-SCS—FORT WORTH, TEXAS 1992

LEGEND

X	Elevation Reference Marks	43	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

LEGEND

X Elevation Reference Marks

72 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

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SOIL CONSERVATION SERVICE
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

SHEET 15 OF 21

USDA-SCS-FORT WORTH, TEXAS 1982

LEGEND

X Elevation Reference Marks

44 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
Park Aerial Surveys Inc. 12-6-78

USDA—SCS—FORT WORTH TEXAS 1982

SHEET 16 OF 21

U. S. DEPARTMENT OF AGRICULTURE
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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

USDA—SCS—FORT WORTH TEXAS 1982

LEGEND

X	Elevation Reference Marks	47	Cross Section Location
	100 Year Flood Hazard Area		Stream Channel
	500 Year Flood Hazard Area		

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
Park Aerial Surveys Inc. 12-6-78

SHEET 17 OF 21

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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

USDA-SCS-FORT WORTH, TEXAS 1982

STUDY LIMIT

PBM 1

BM 53A

Toccoa Falls Drive

Georgia Hwy. 17

Toccoa Creek

61 60 59 58 57 56 55 54 53 52 51 50

LEGEND

X Elevation Reference Marks

52 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
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SHEET 18 OF 21

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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

TOCCOA CREEK

USDA-SCS—FORT WORTH, TEXAS 1982

STUDY LIMIT

75

72

Camp Mikell Road

BM-69
ELEV.

72A

LEGEND

X Elevation Reference Marks

75 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
Park Aerial Surveys Inc. 12-6-78

SHEET 19 OF 21

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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

LITTLE TOCCOA CREEK

USDA–SCS–FORT WORTH, TEXAS 1982

LEGEND

X — Elevation Reference Marks

79 — Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

Photography by
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400 0 400
Scale in Feet

100 0 100
Scale in Meters

SHEET 20 OF 21

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STEPHENS COUNTY, GEORGIA

FLOOD HAZARD AREA

CEDAR CREEK

LEGEND

X Elevation Reference Marks

90 Cross Section Location

100 Year Flood Hazard Area

Stream Channel

500 Year Flood Hazard Area

400 0 400
Scale in Feet

100 0 100
Scale in Meters

Photography by
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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

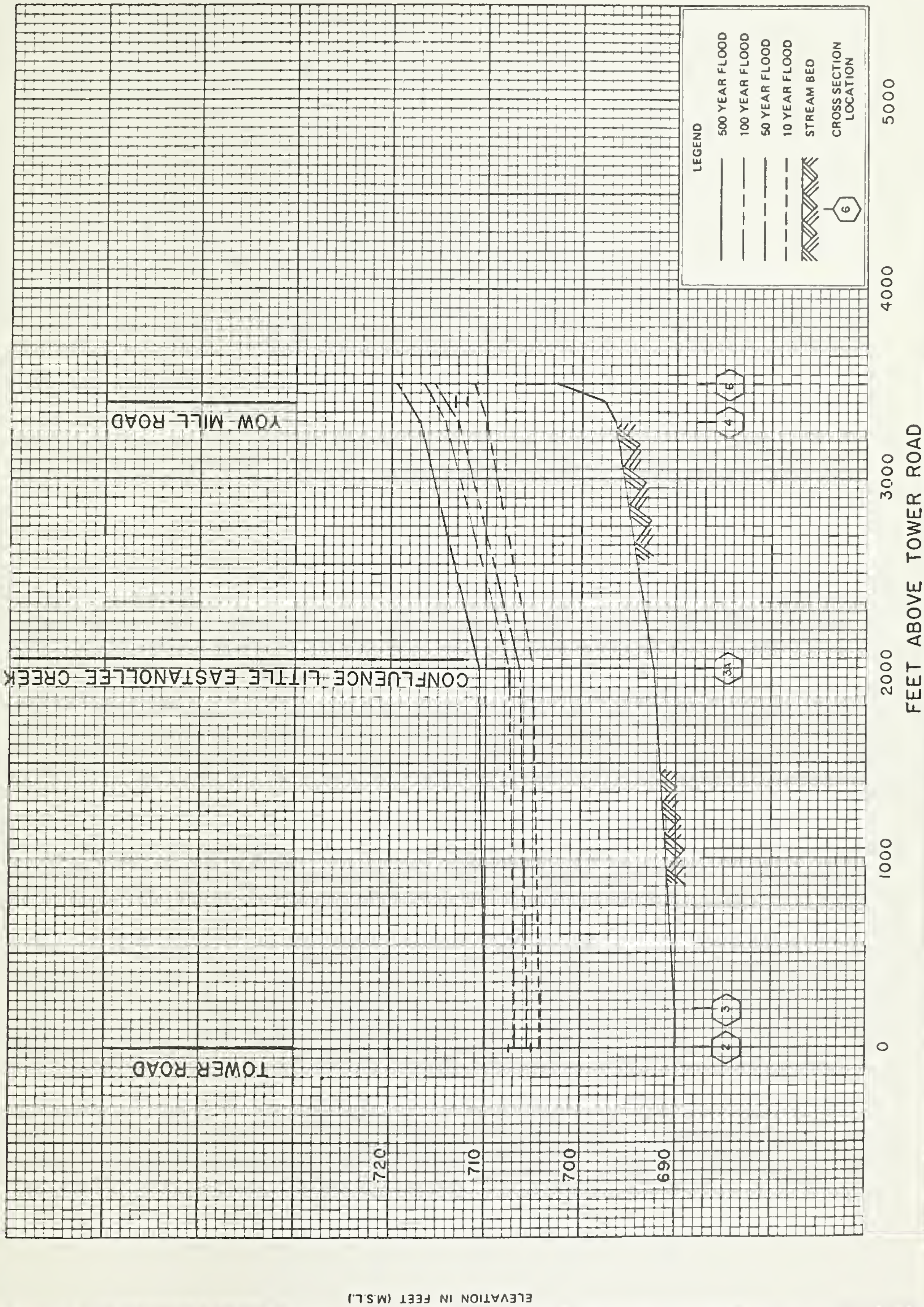
FLOOD HAZARD AREA

CEDAR CREEK

SHEET 21 OF 21

USDA-SCS-FORT WORTH TEXAS 1982

APPENDIX A



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FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

EASTANOLLEE CREEK

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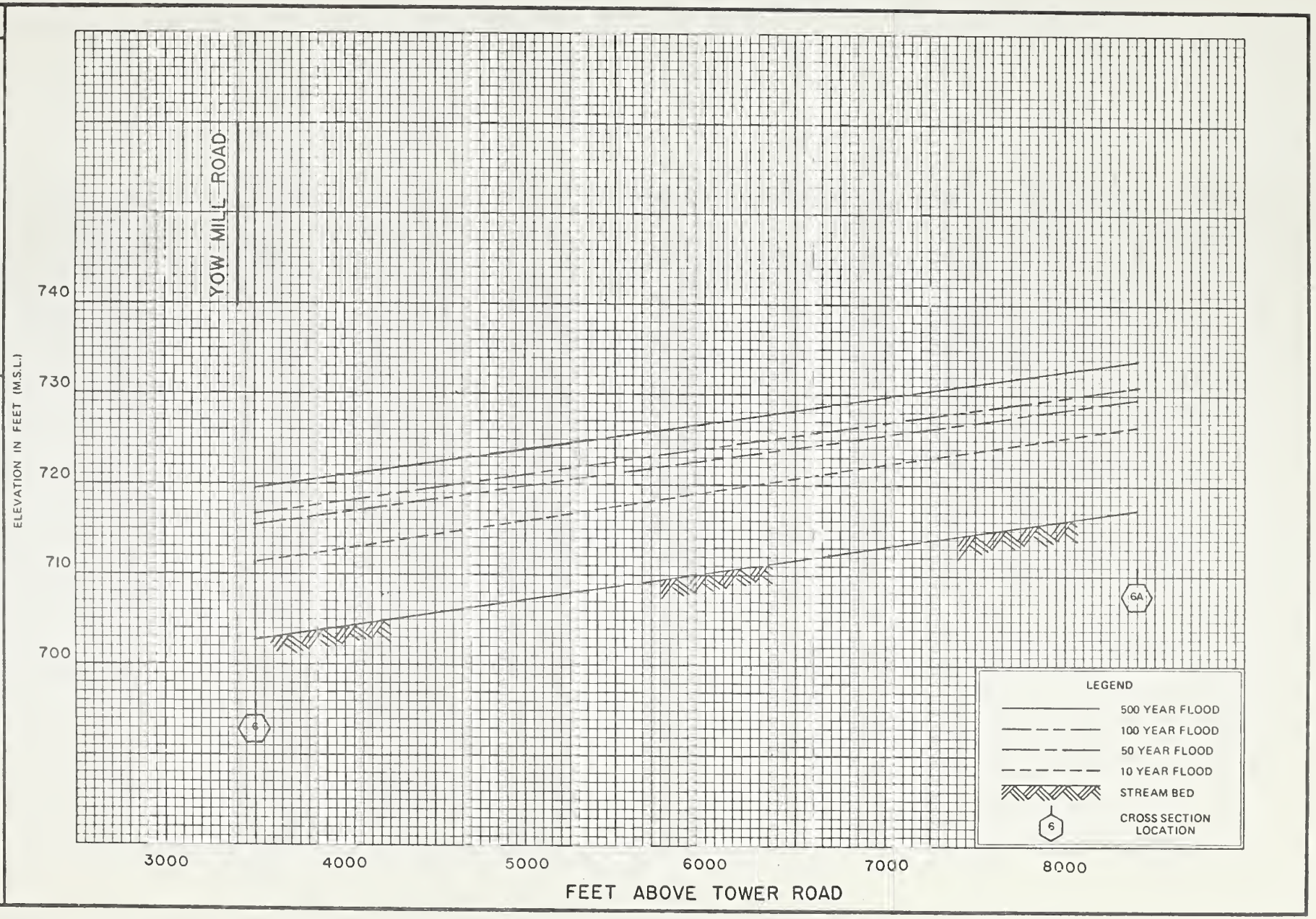
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

EASTANOLLEE CREEK



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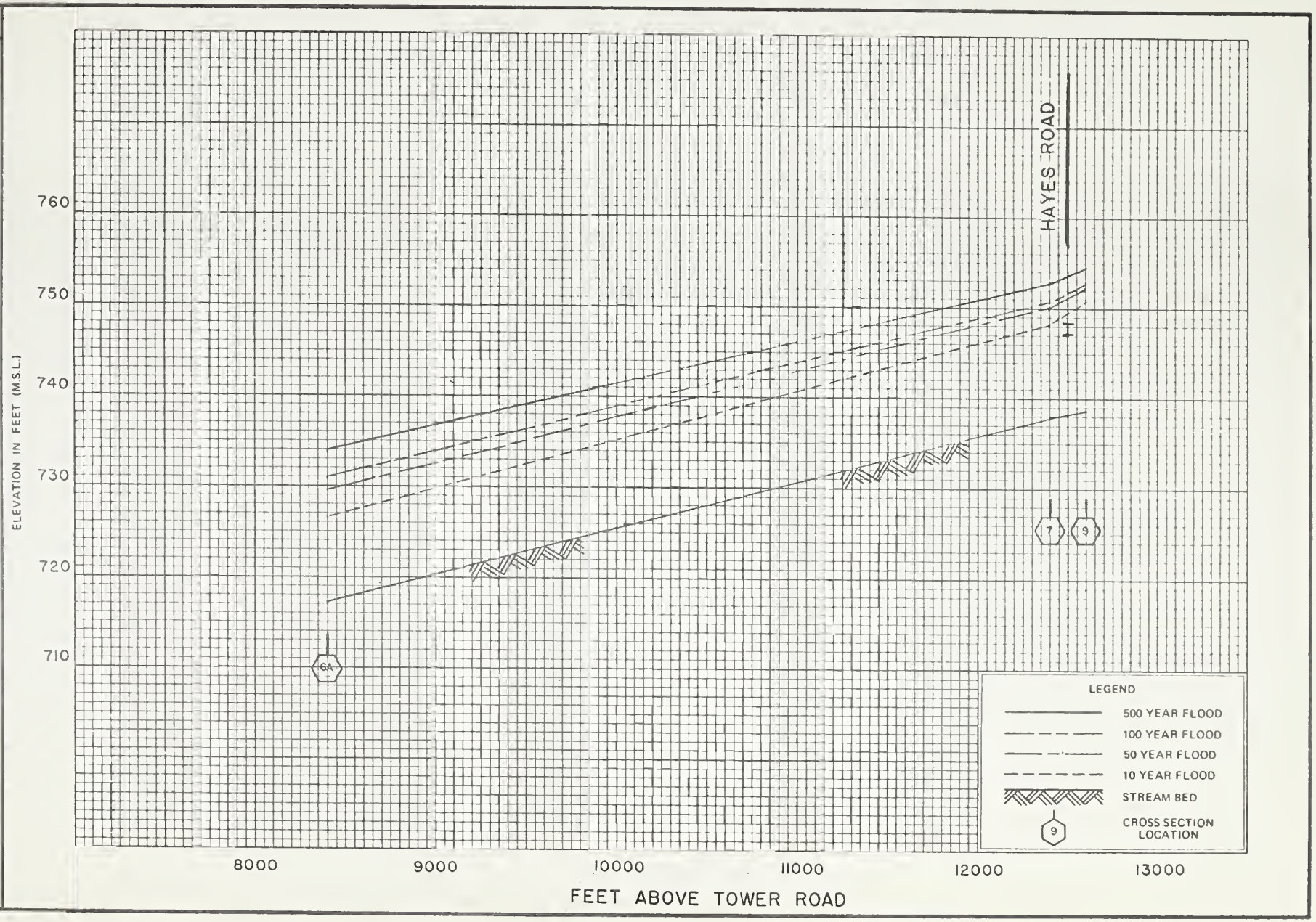
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

EASTANOLLEE CREEK



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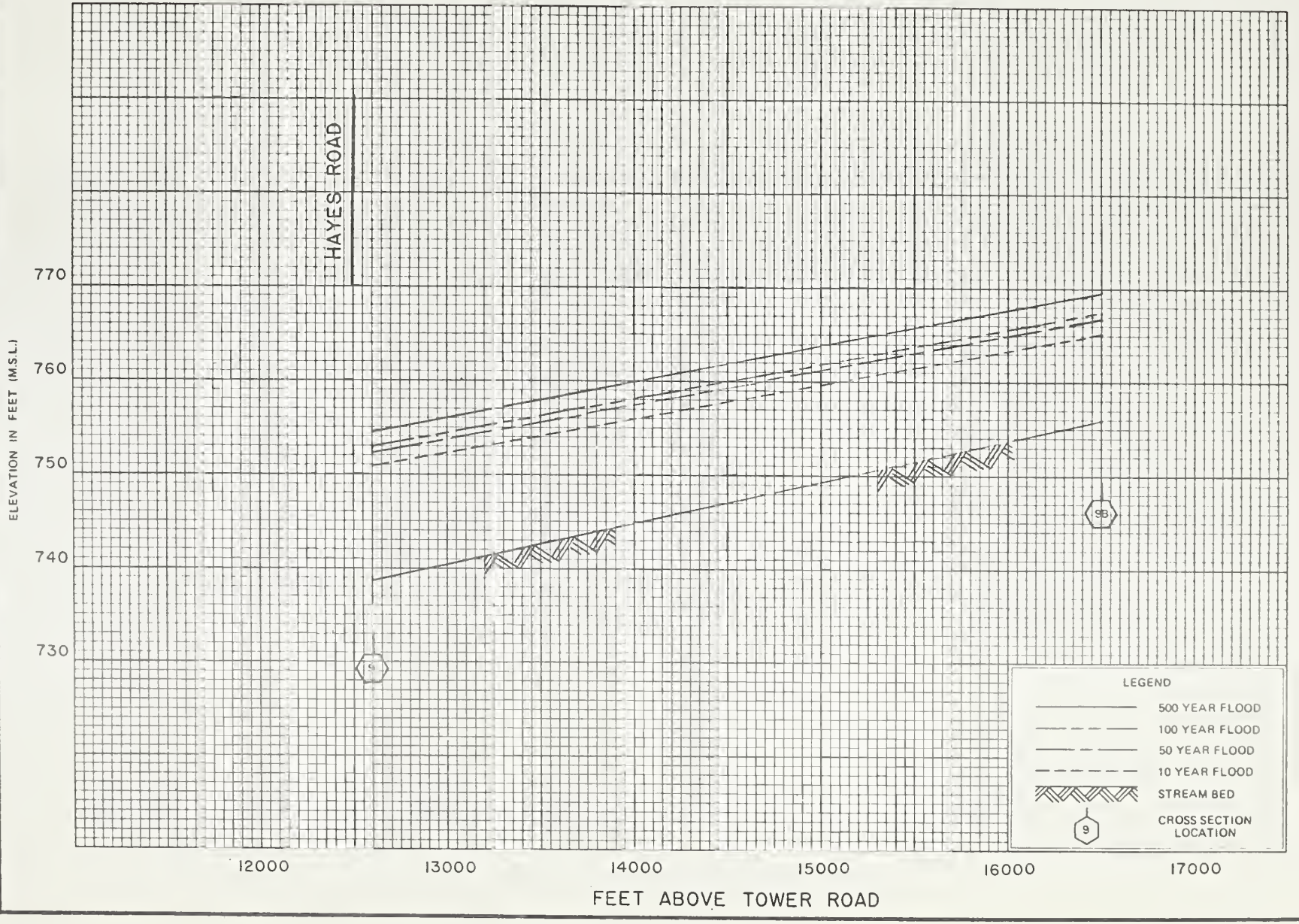
SOIL CONSERVATION SERVICE
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

EASTANOLLEE CREEK



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TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
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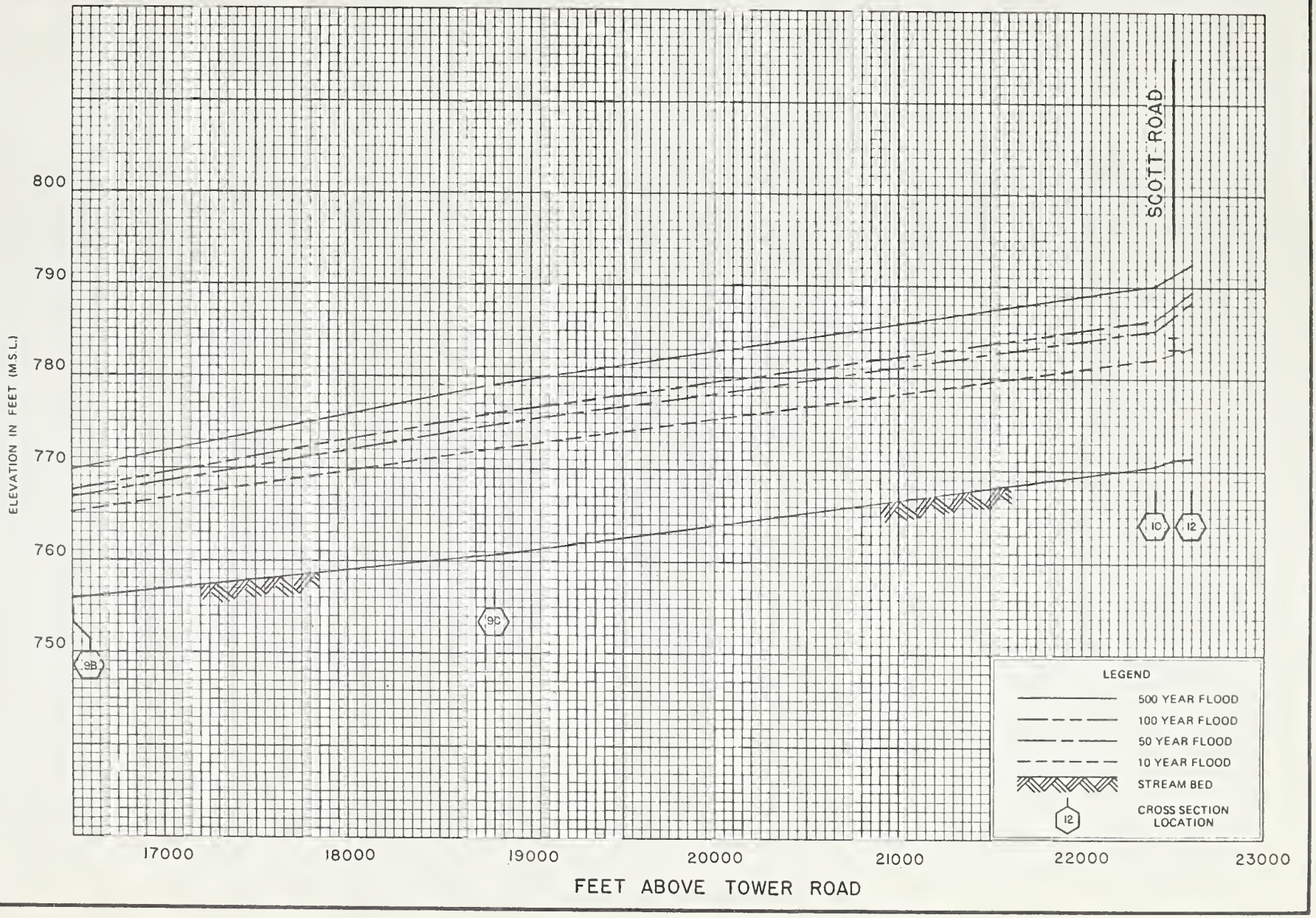
FLOOD PROFILES

EASTANOLLEE CREEK



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STEPHENS COUNTY, GEORGIA

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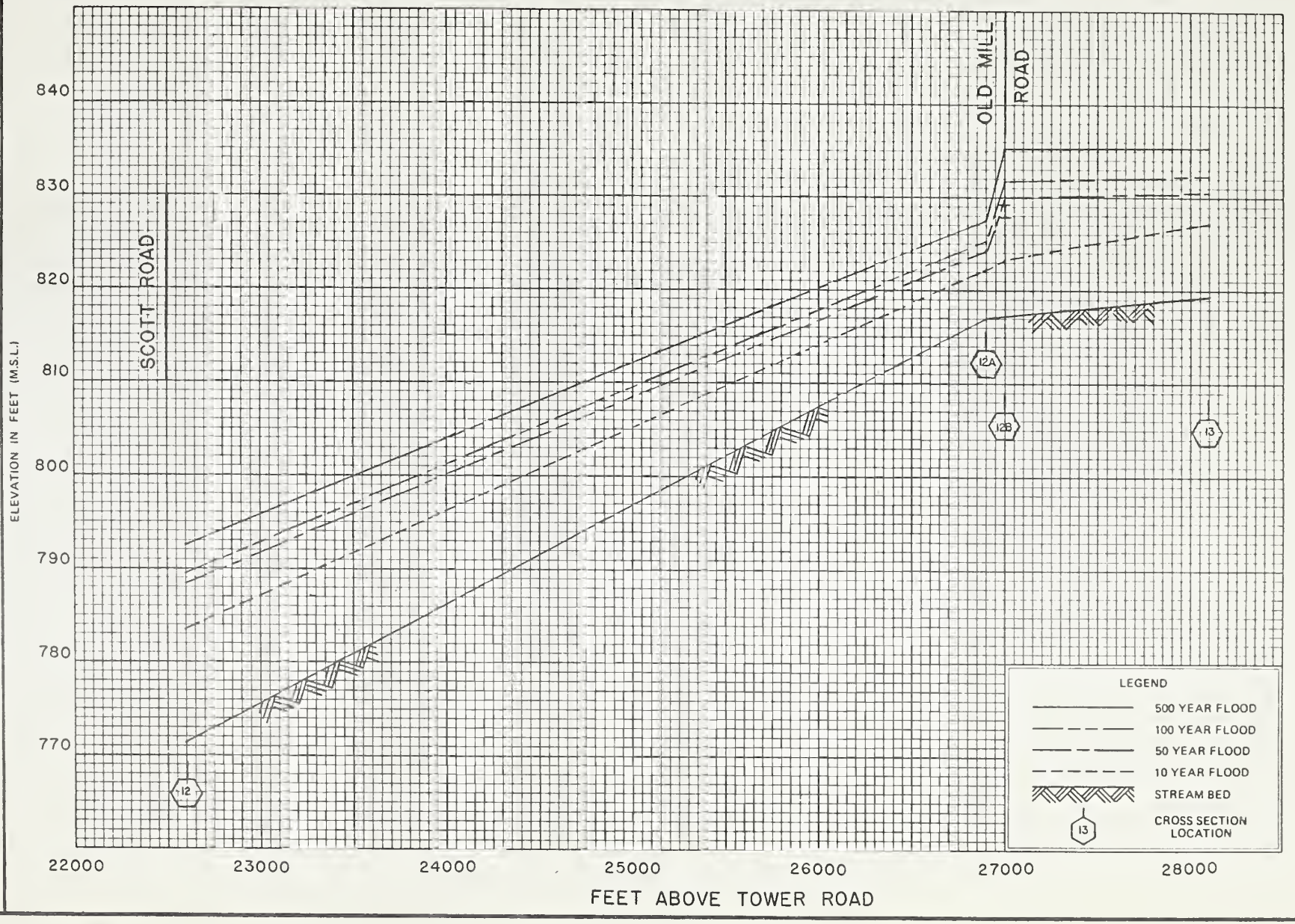
EASTANOLLEE CREEK



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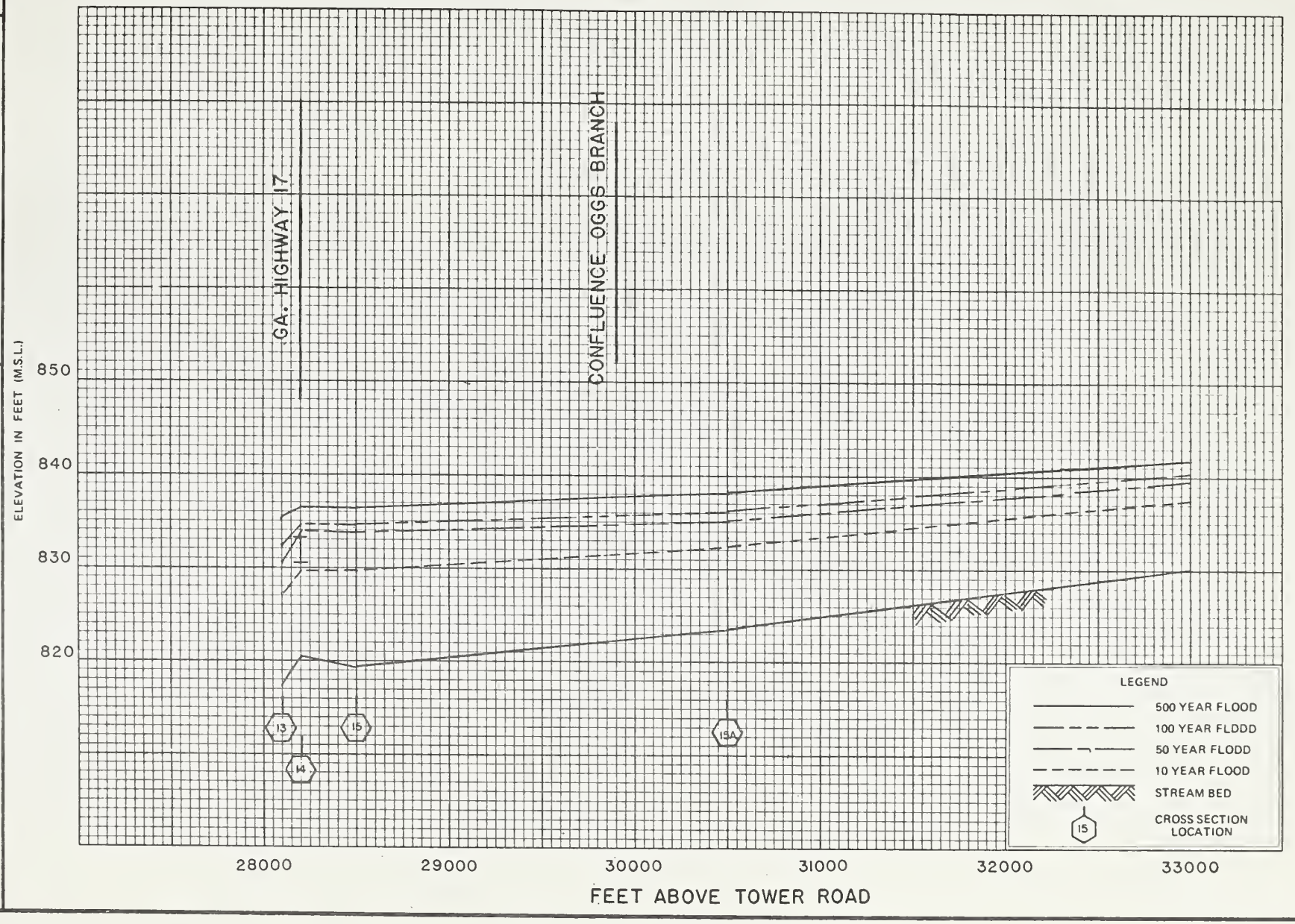
EASTANOLLEE CREEK

FLOOD PROFILES



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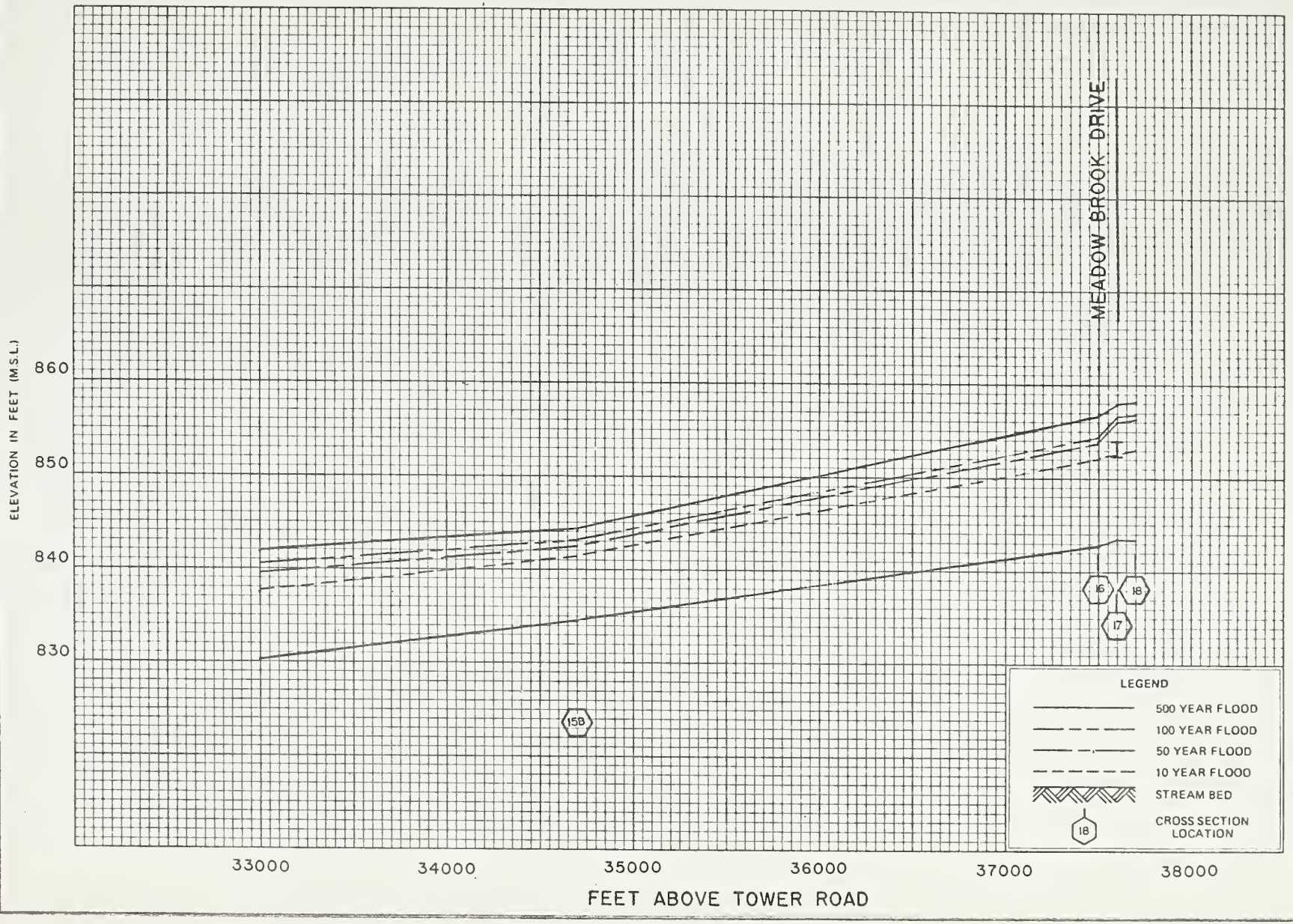
FLOOD PROFILES



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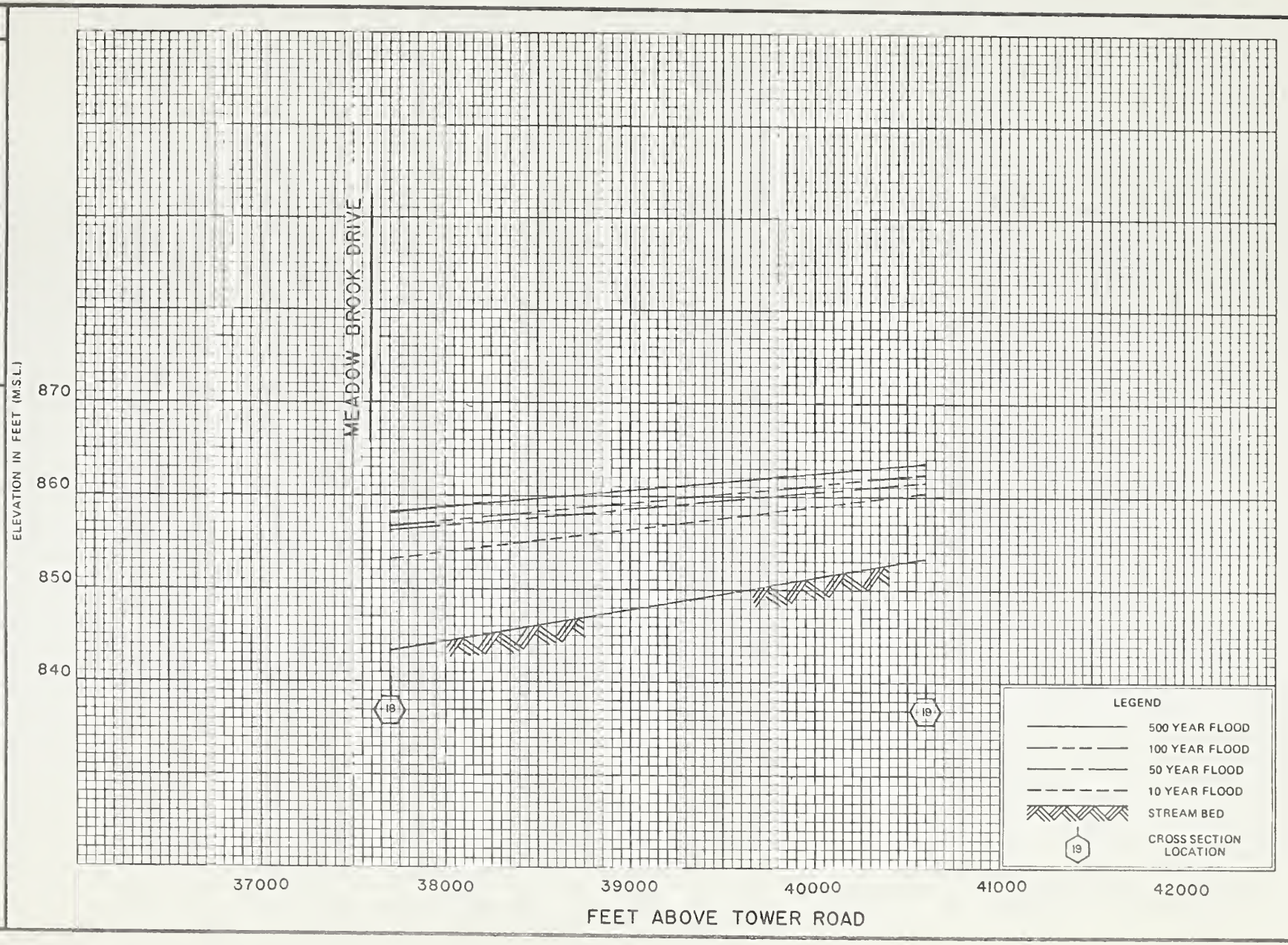
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

EASTANOLLEE CREEK



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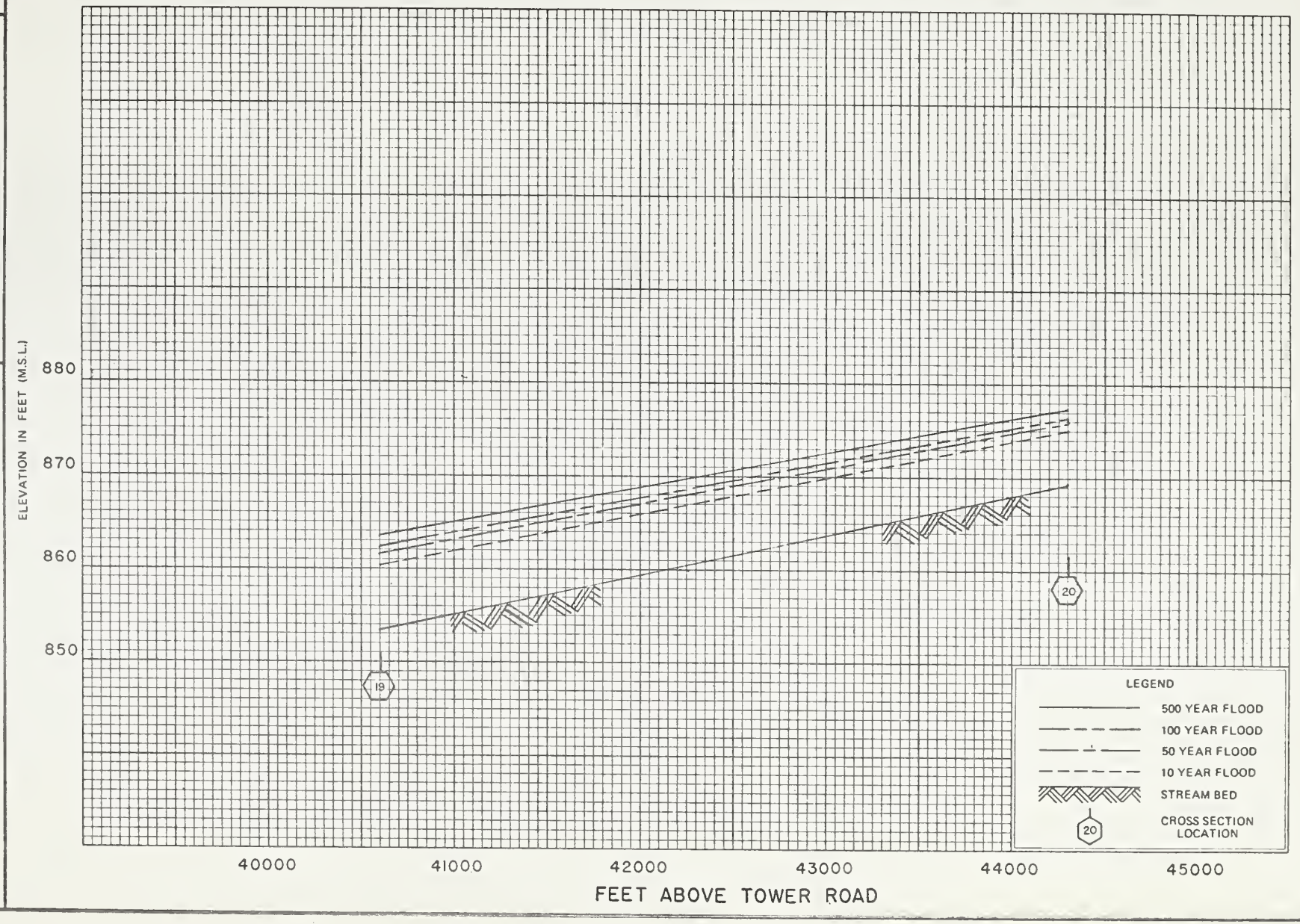
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

EASTANOLLEE CREEK

FLOOD PROFILES



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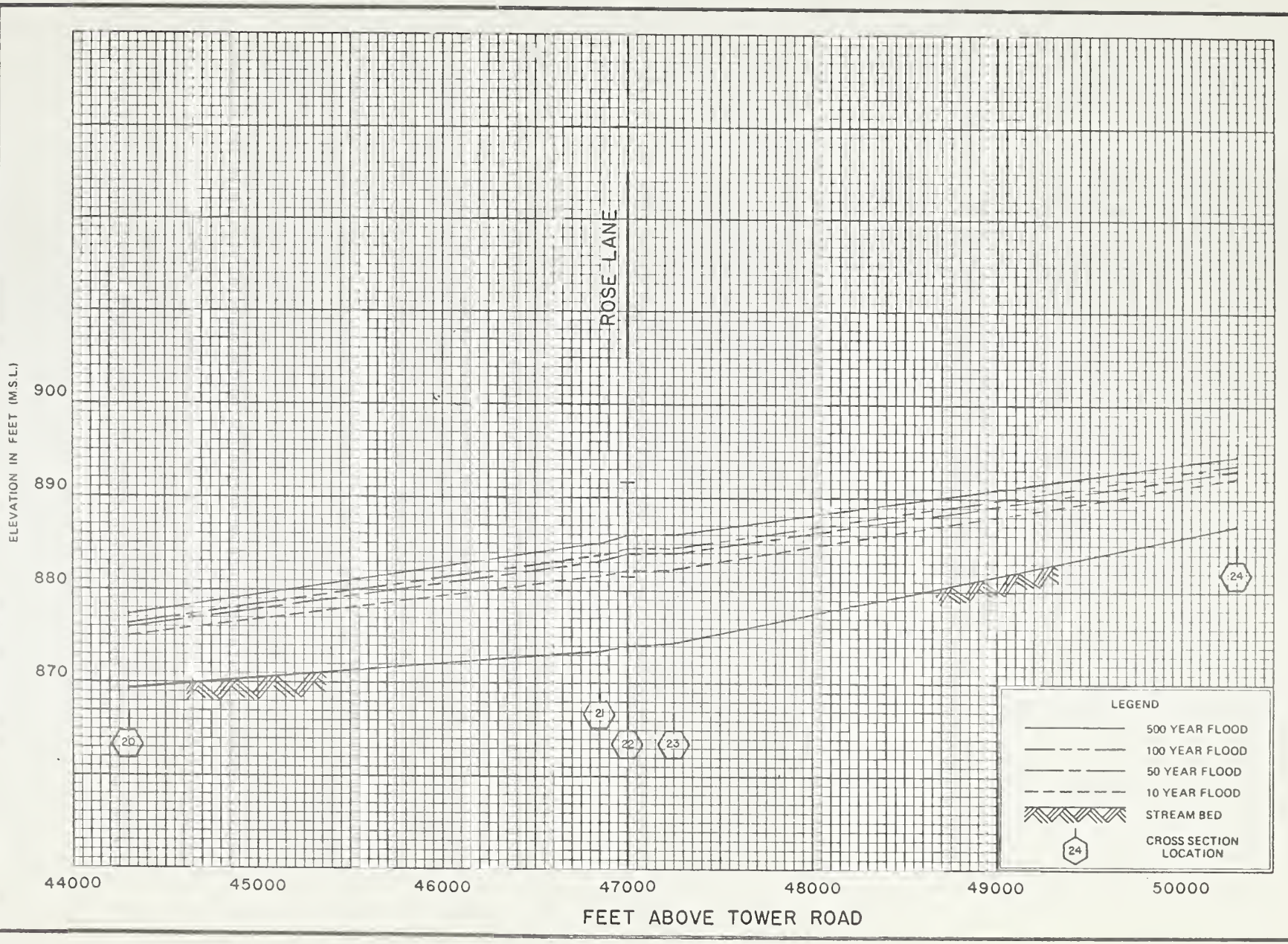

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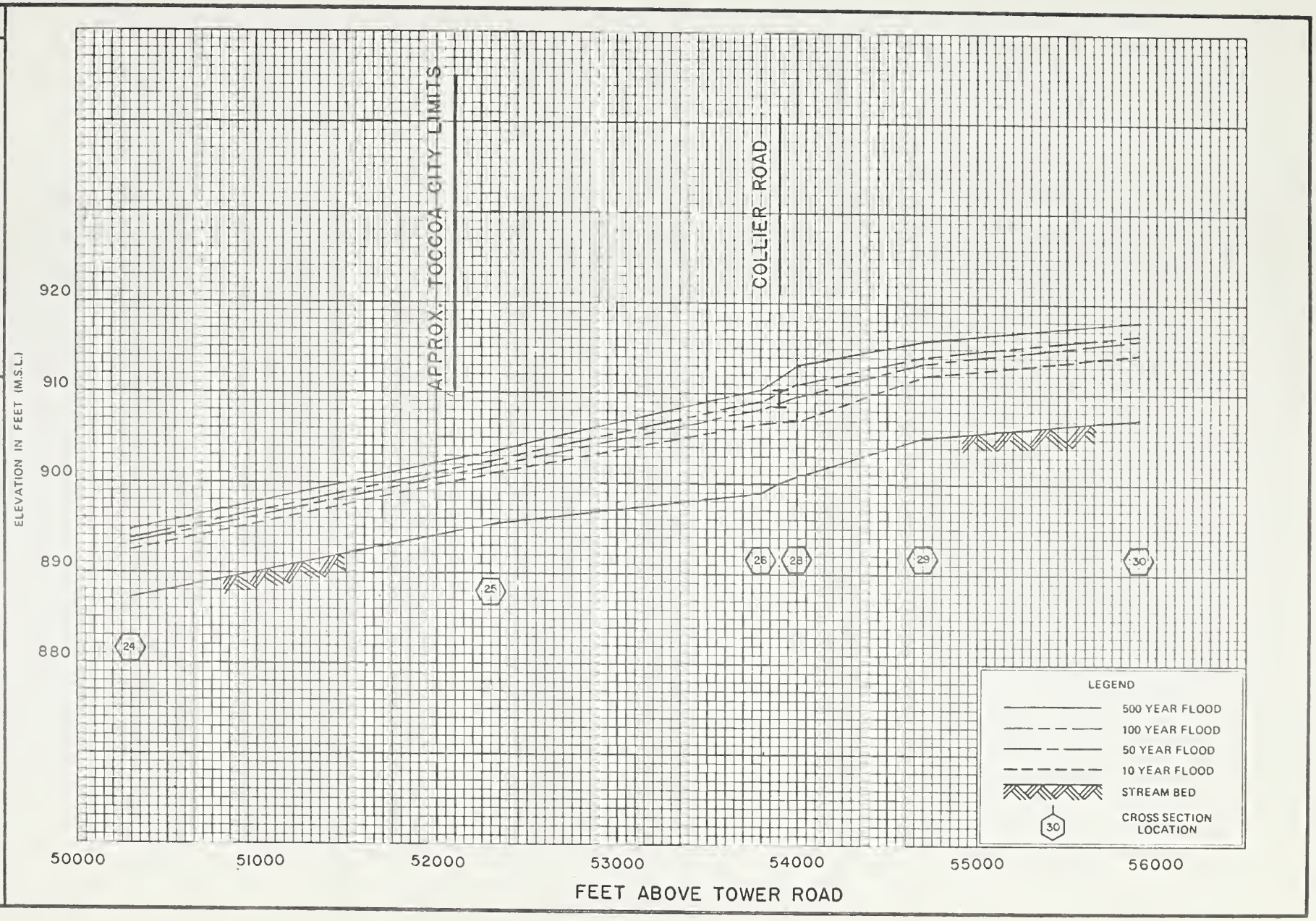
FLOOD PROFILES



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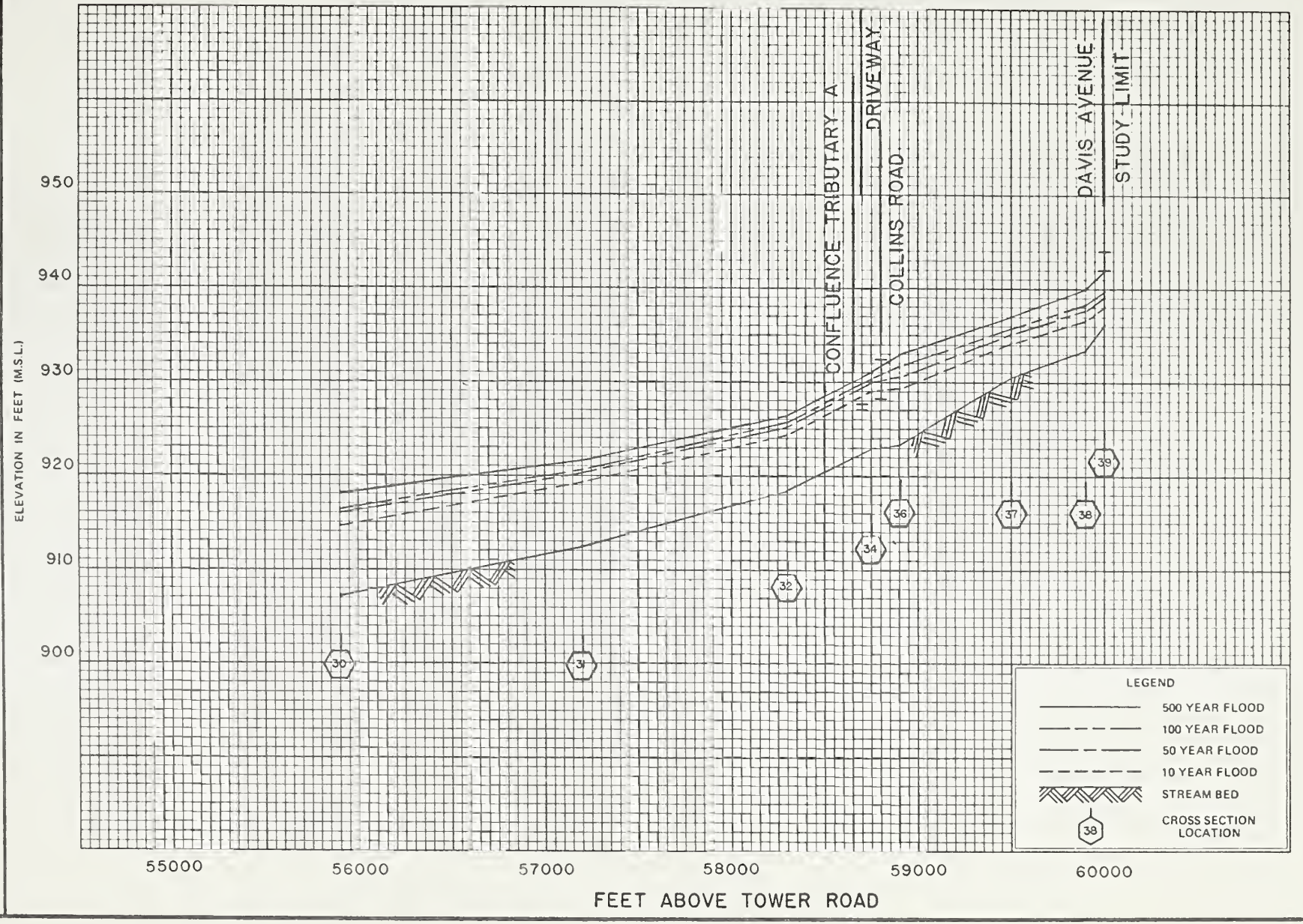

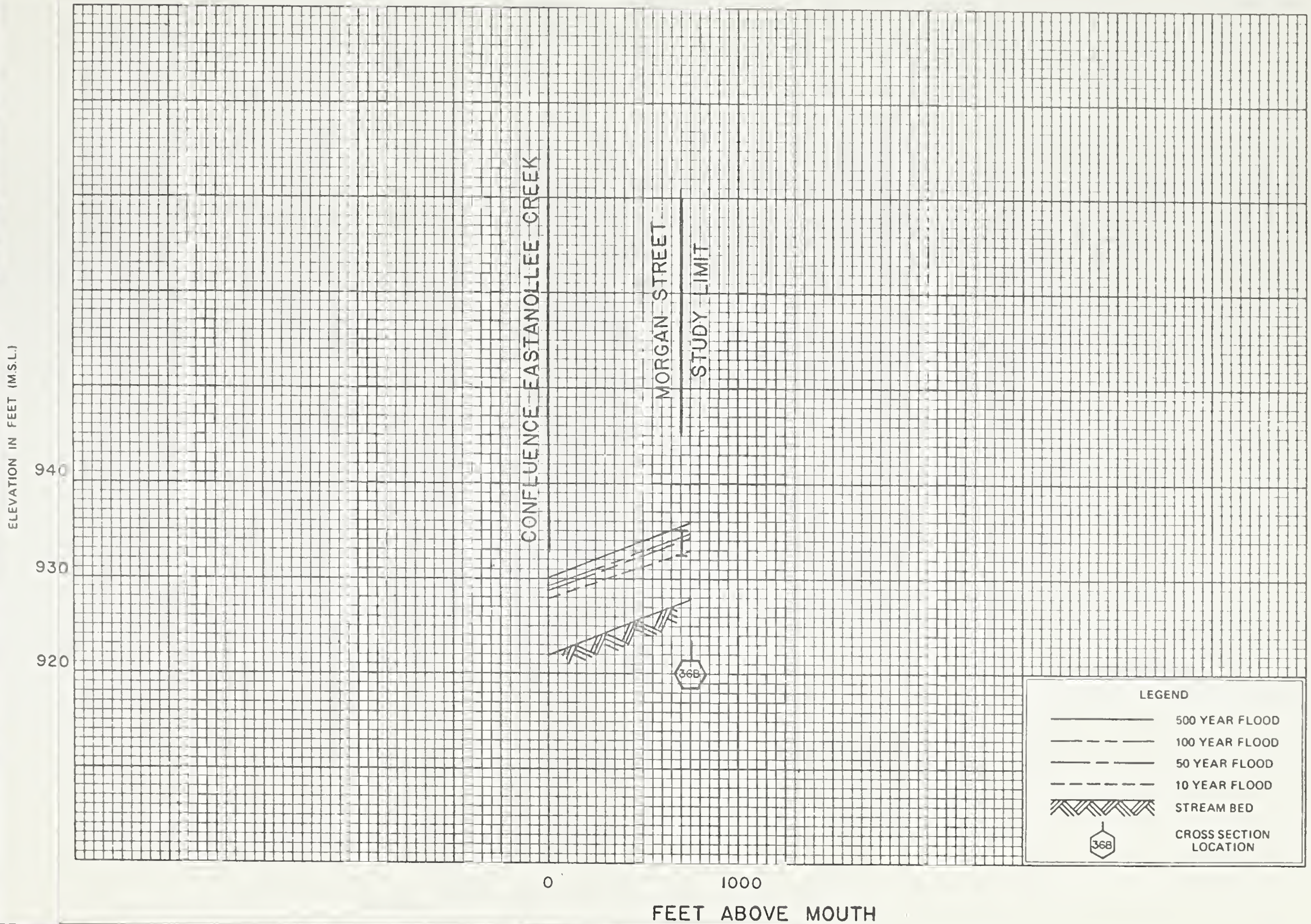

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TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

TRIBUTARY A

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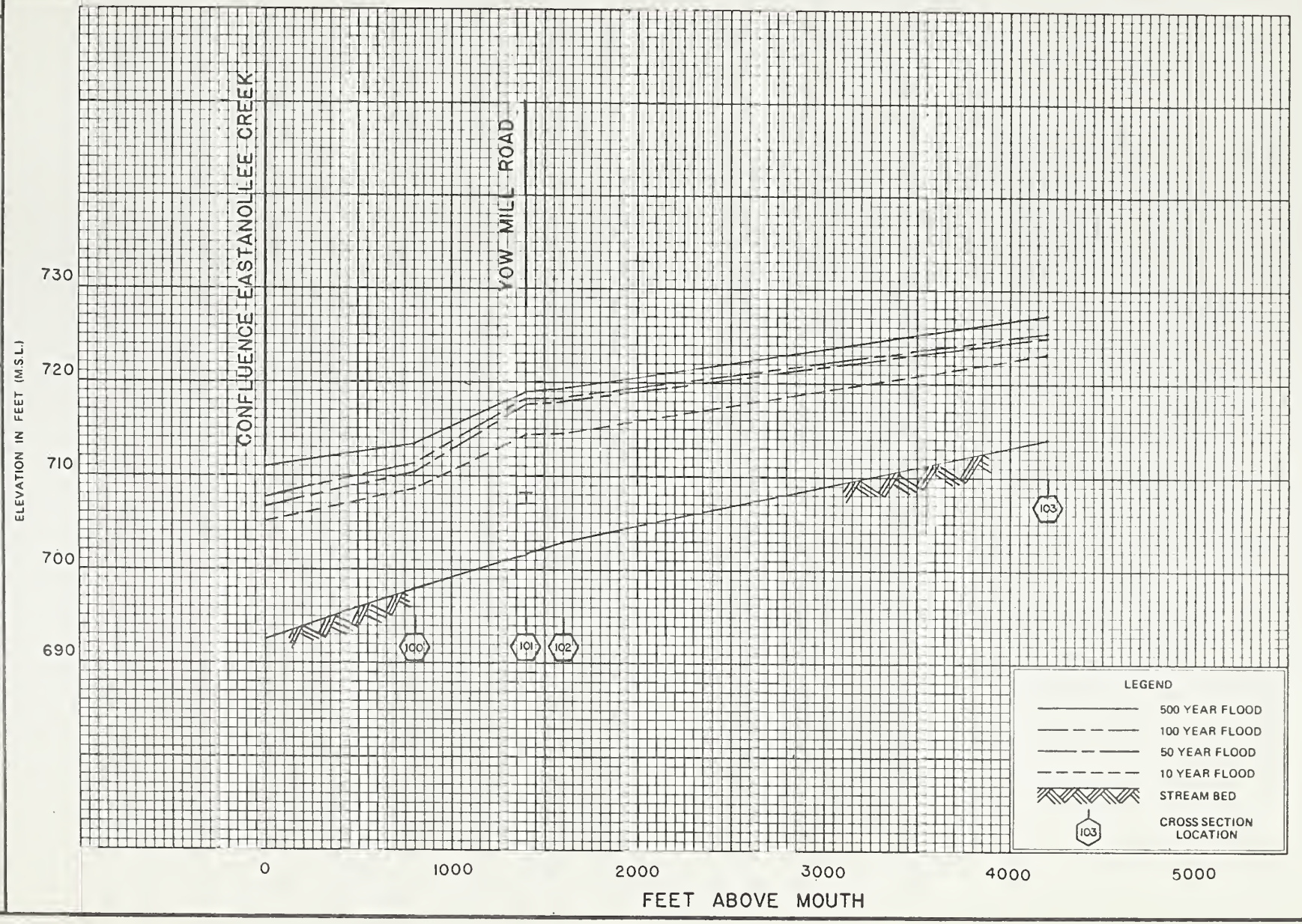
STEPHENS COUNTY, GEORGIA

LITTLE EASTANOLLEE CREEK

FLOOD PROFILES



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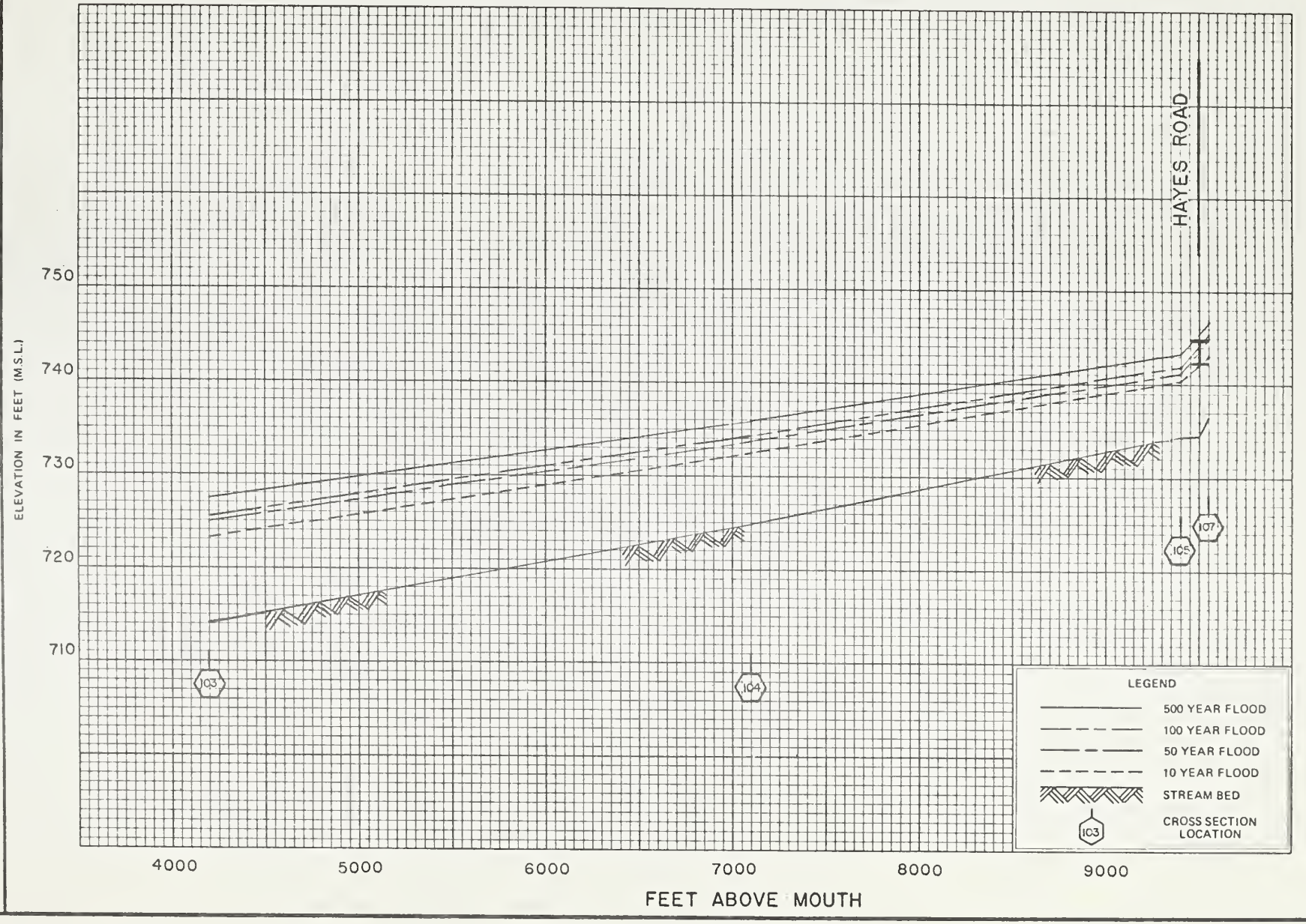
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

LITTLE EASTANOLLEE CREEK



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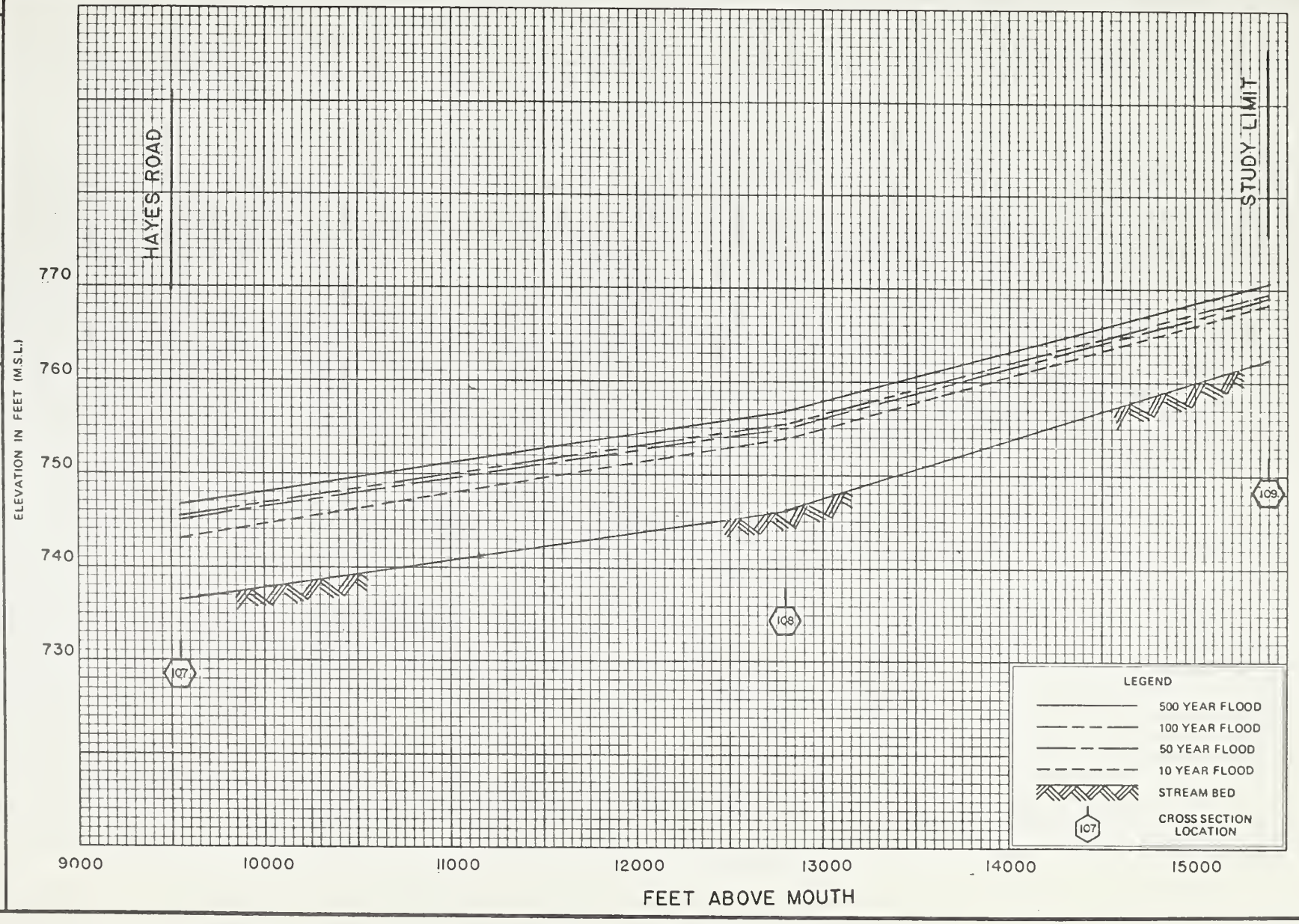
FLOOD PROFILES



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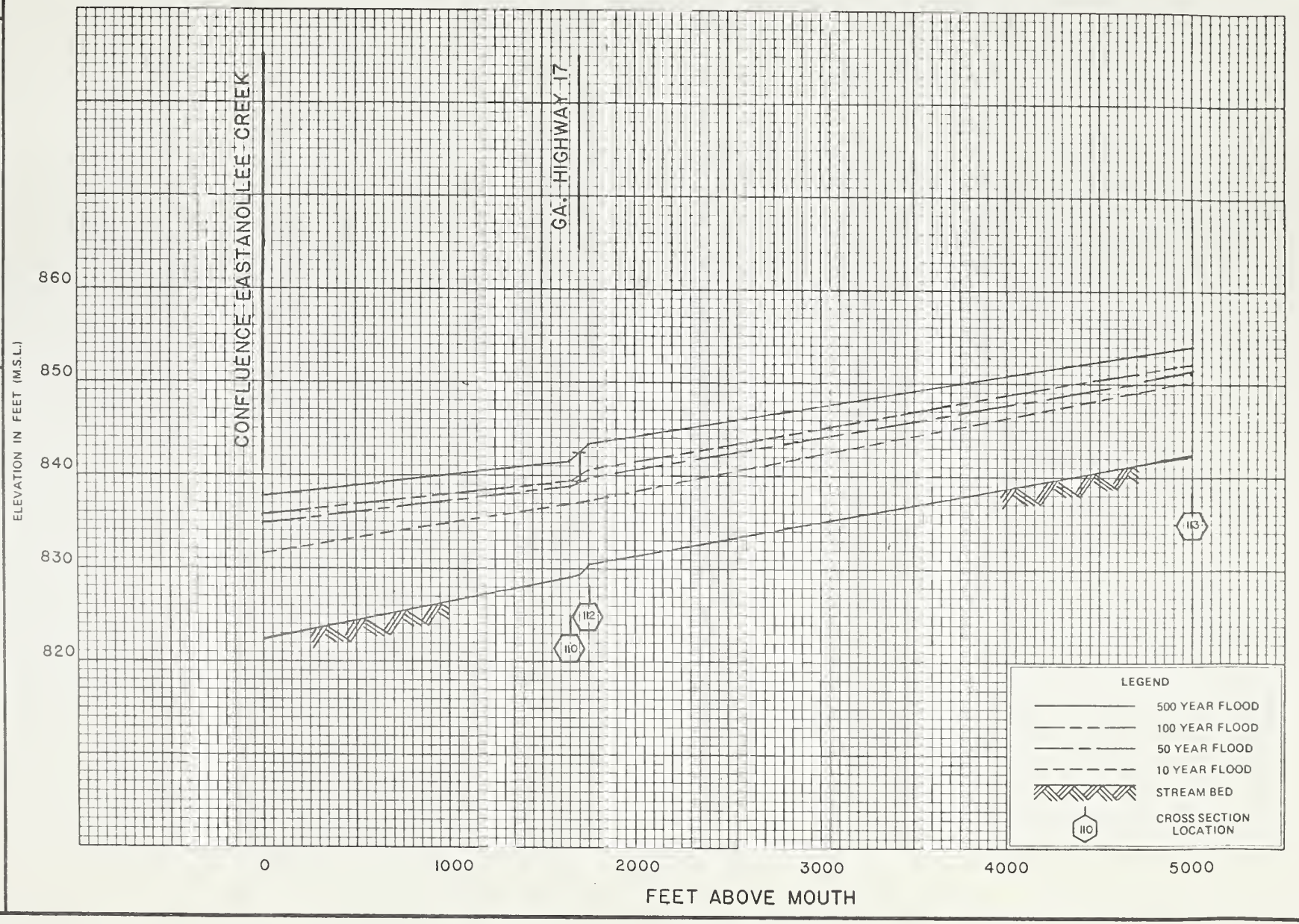
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

OGGS BRANCH



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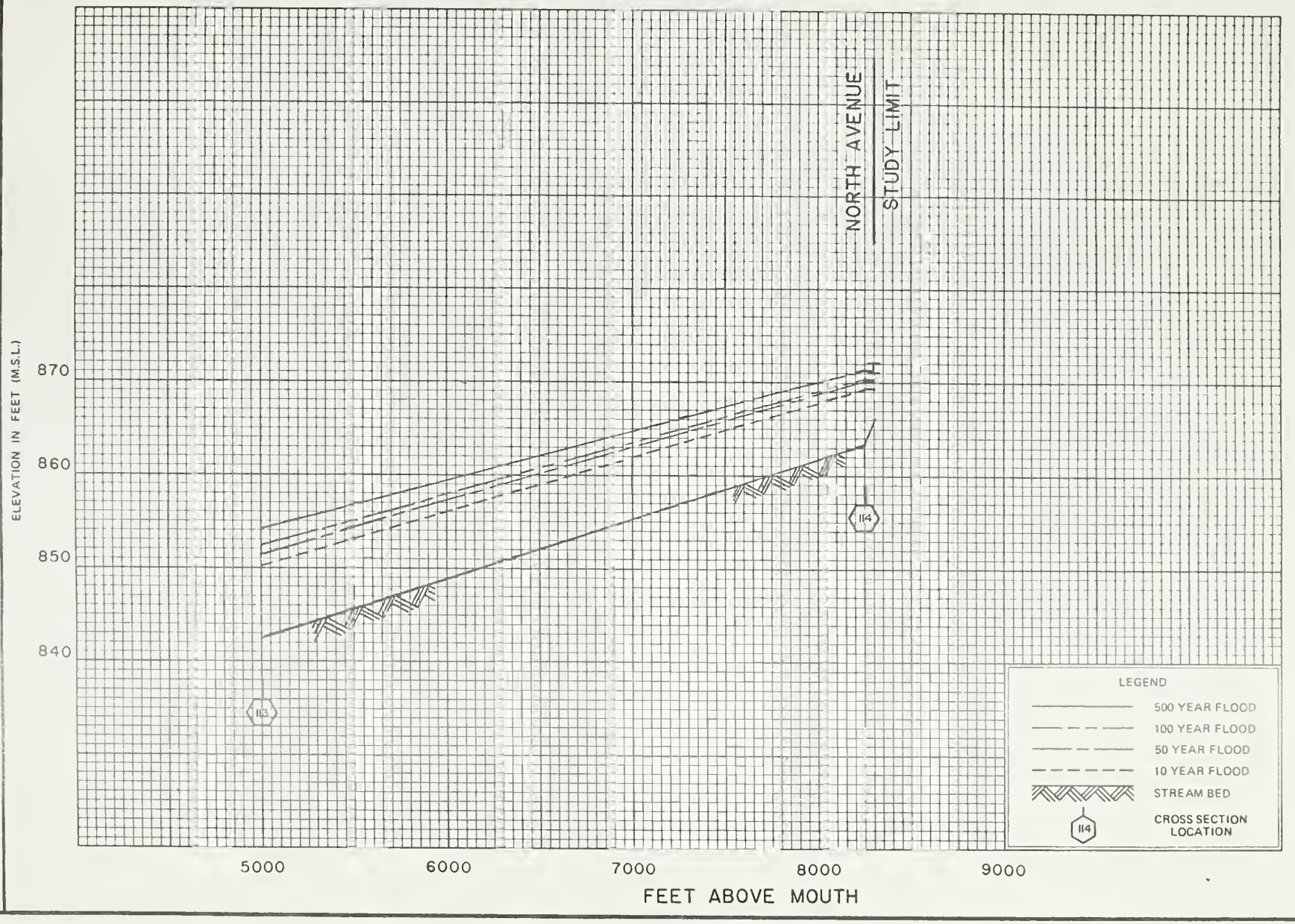
STEPHENS COUNTY, GEORGIA

OGGS BRANCH

FLOOD PROFILES



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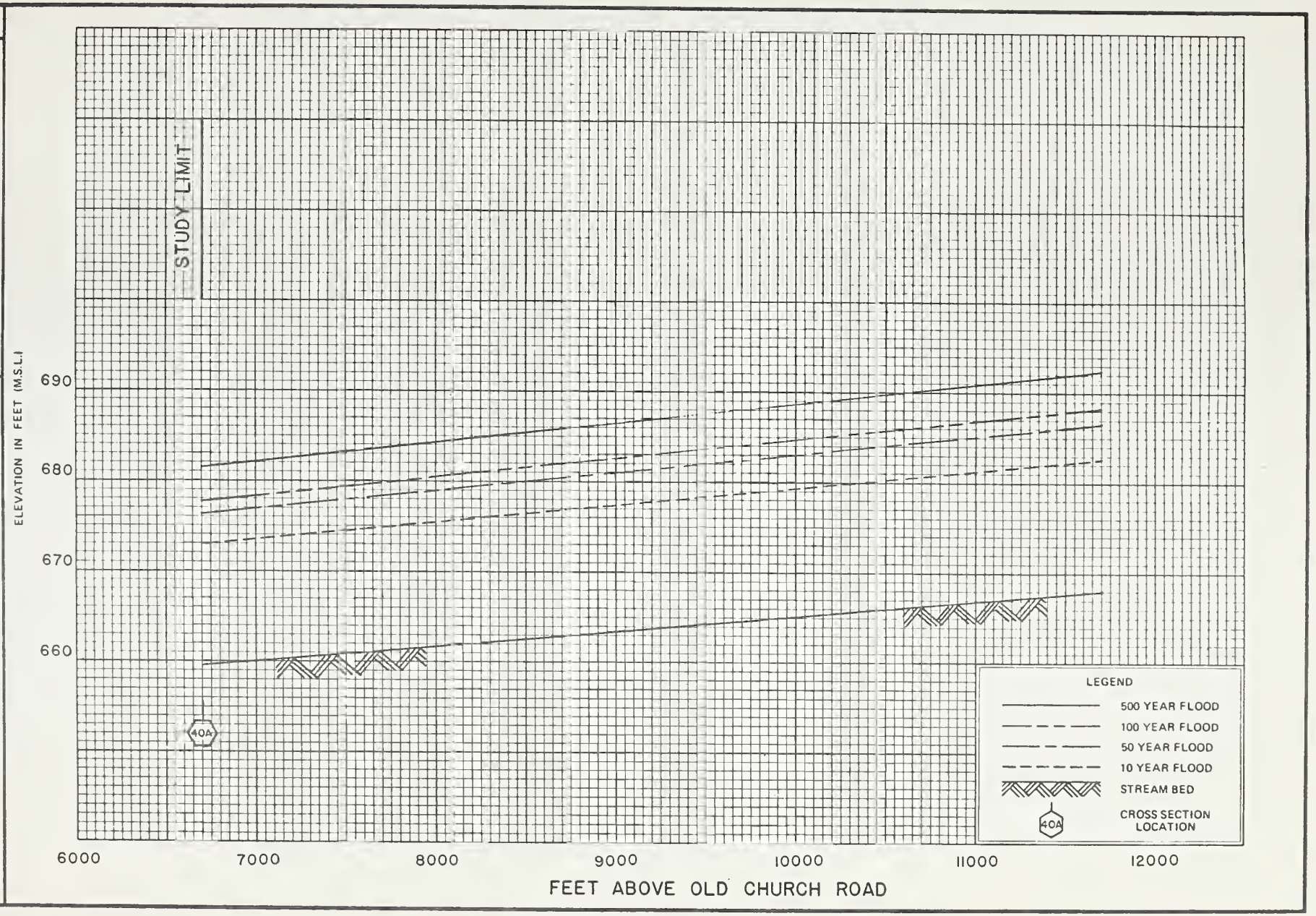
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

TOCCOA CREEK



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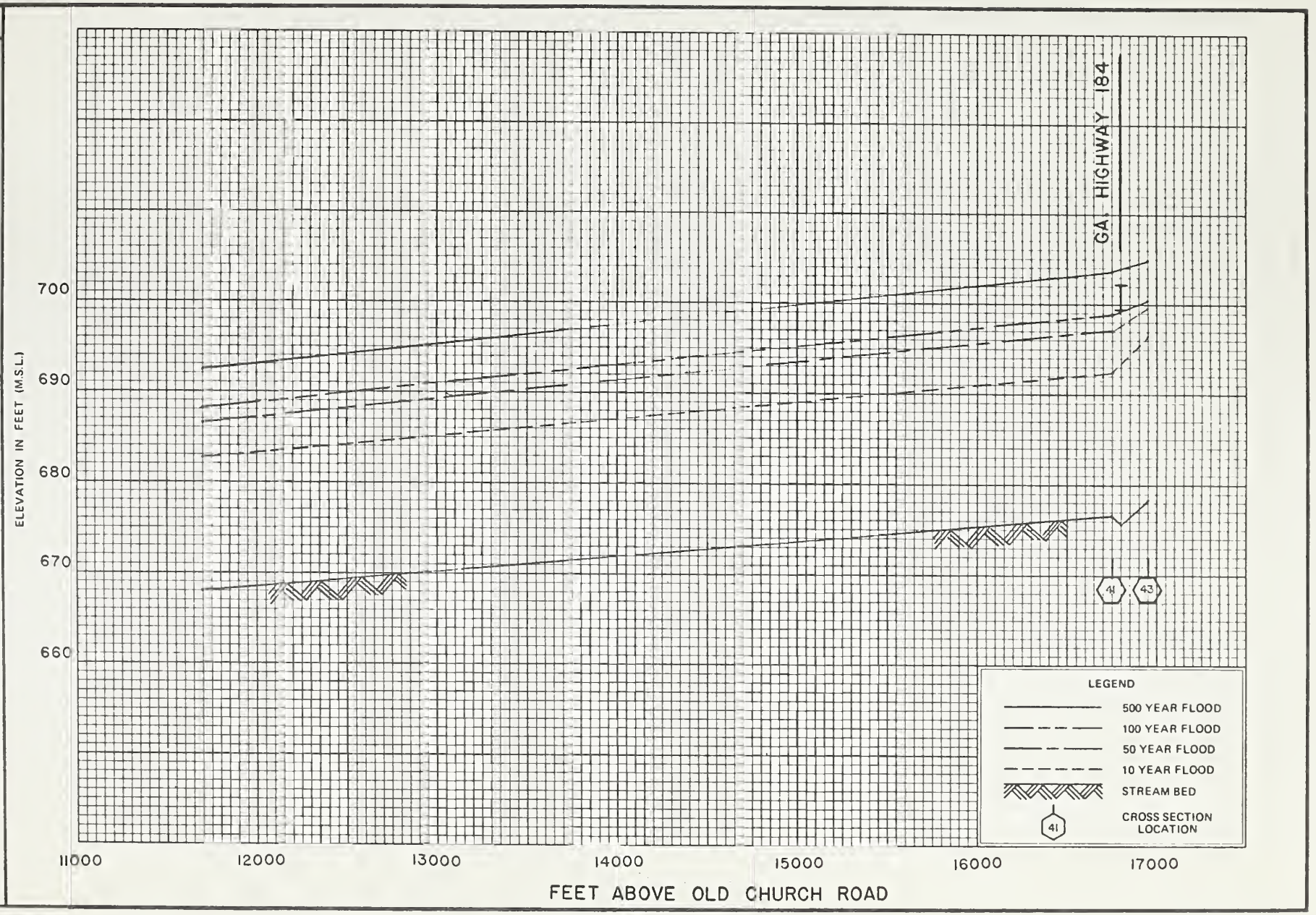
TOCCOA CREEK



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STEPHENS COUNTY, GEORGIA

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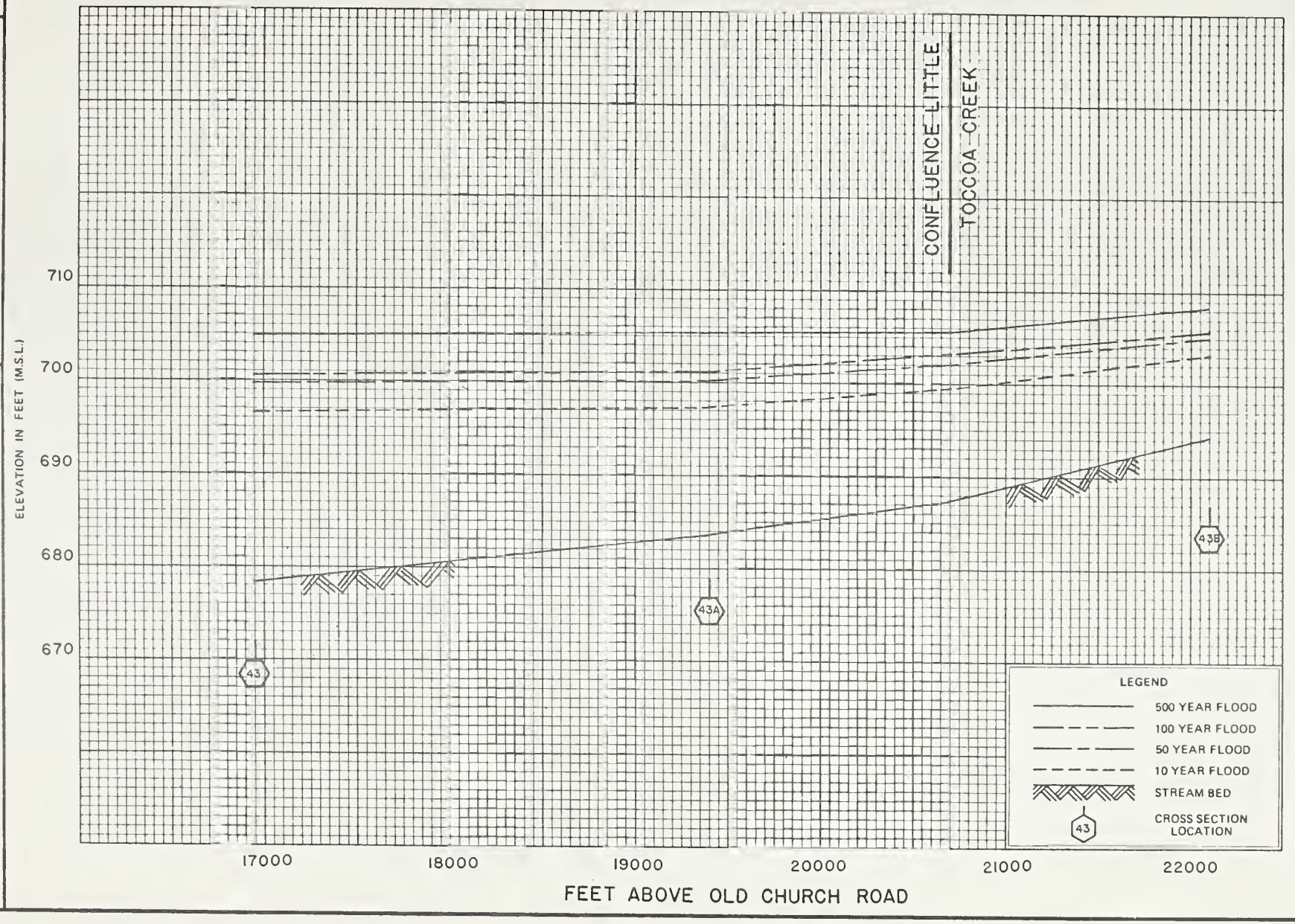
TOCCOA CREEK



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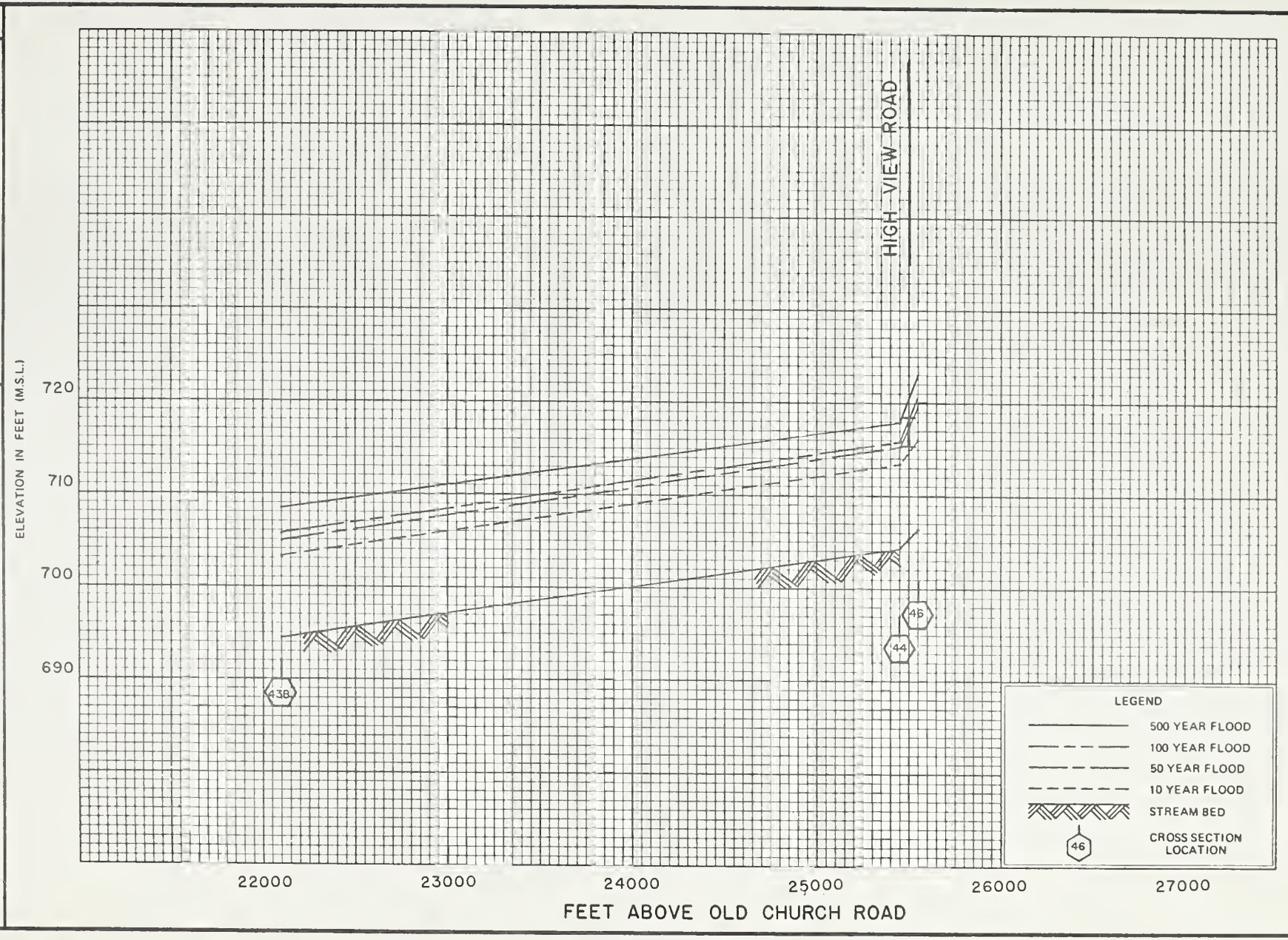
STEPHENS COUNTY, GEORGIA

TOCCOA CREEK

FLOOD PROFILES



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STEPHENS COUNTY, GEORGIA

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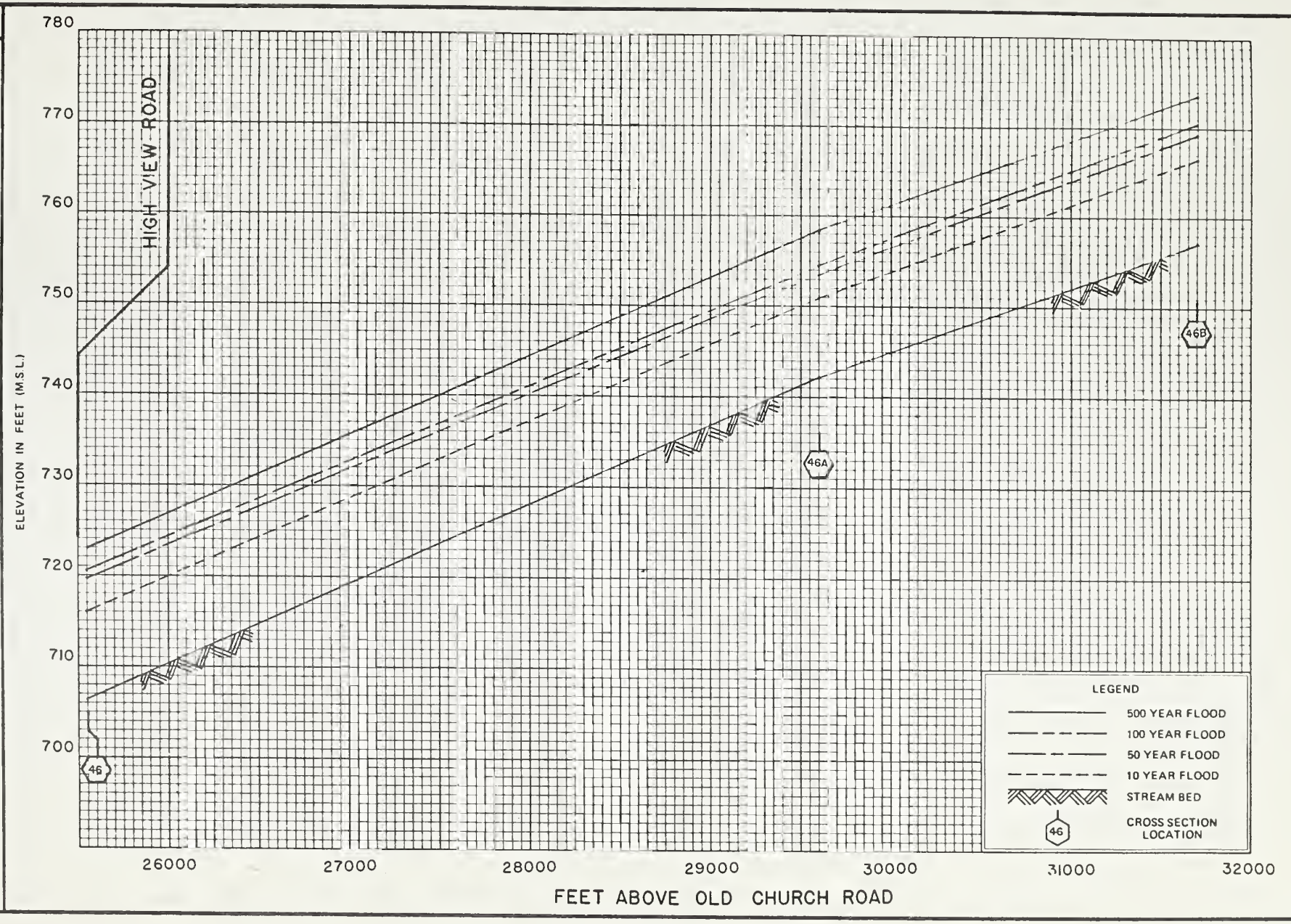
TOCCOA CREEK



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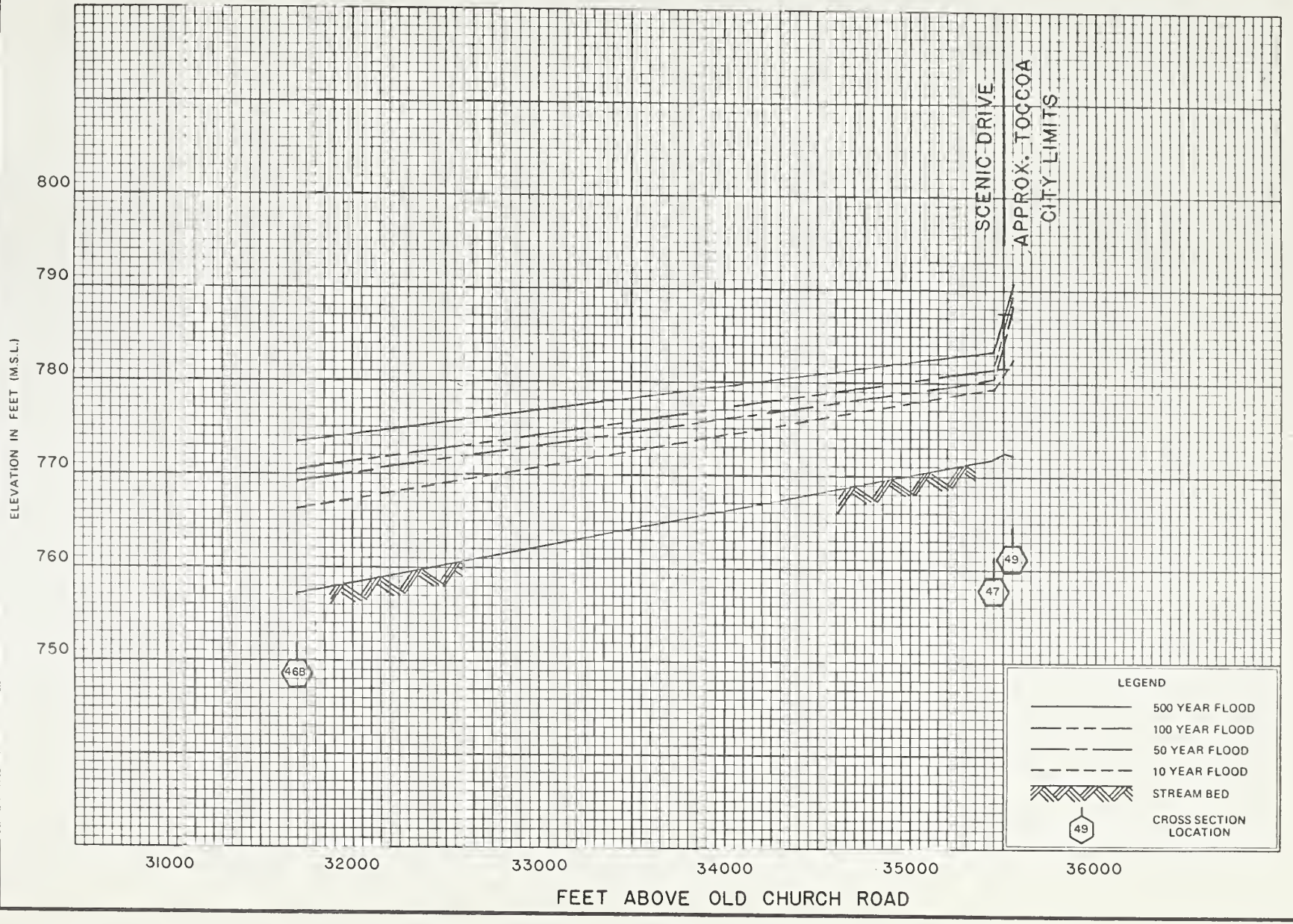
TOCCOA AND ESTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

TOCCOA CREEK



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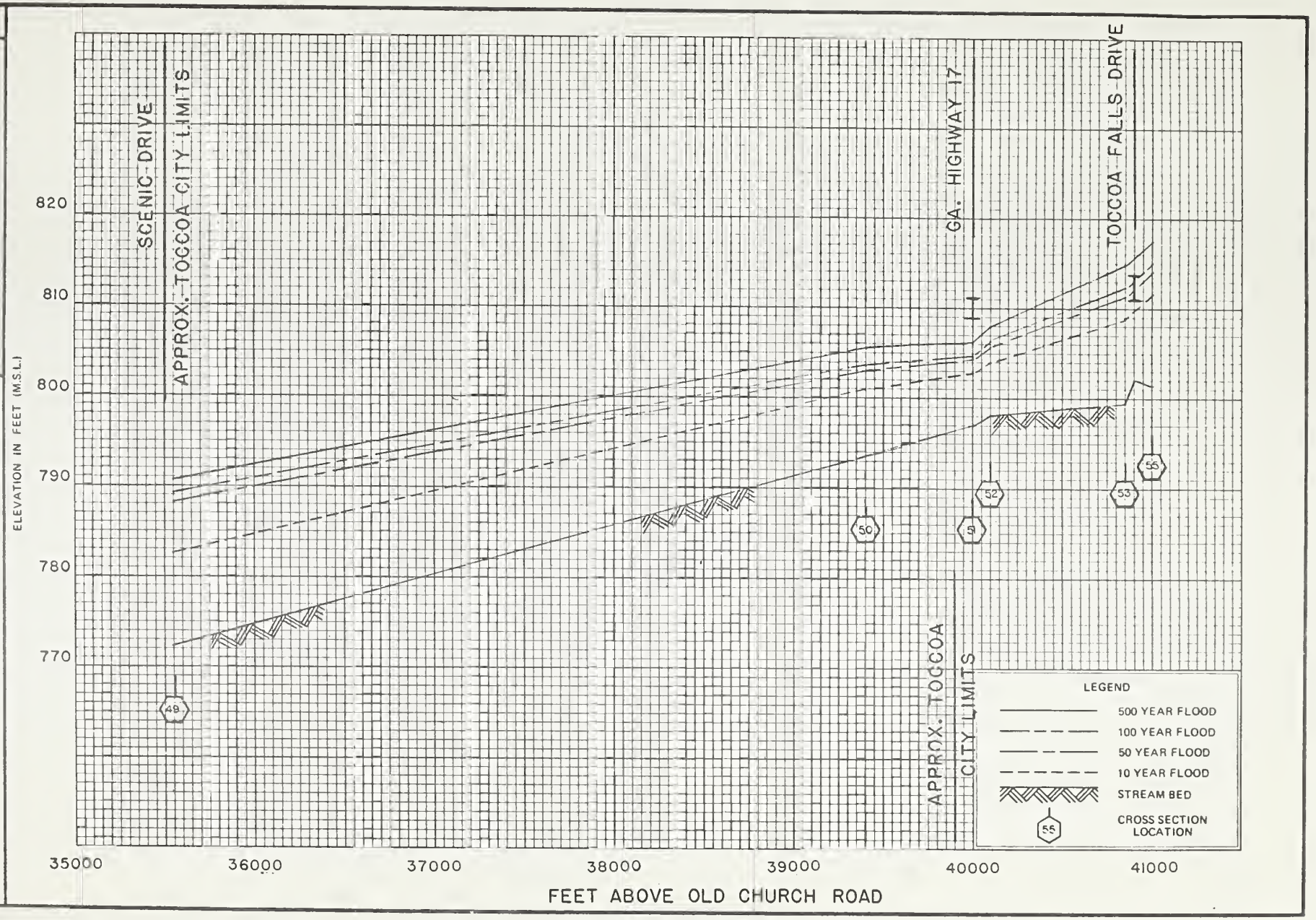

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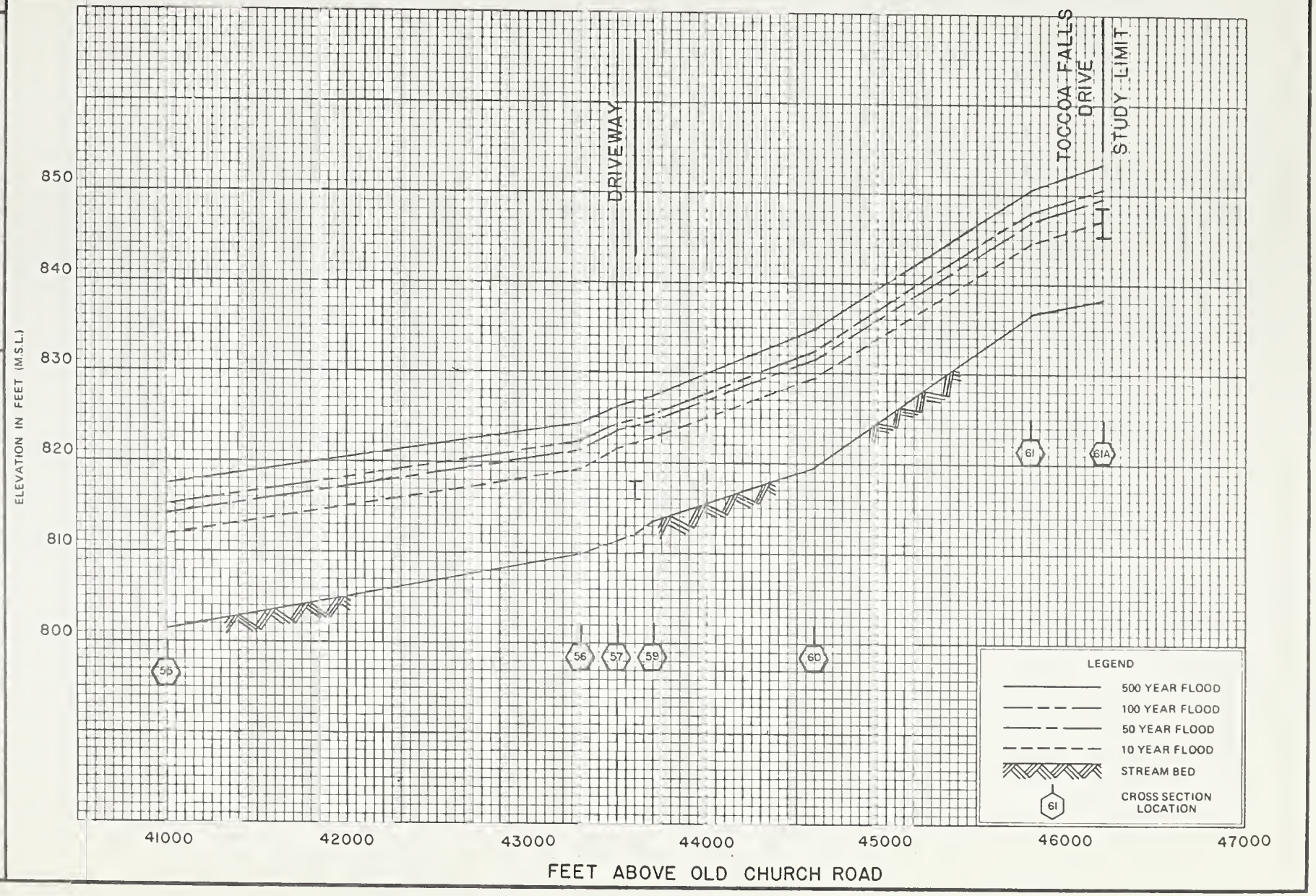

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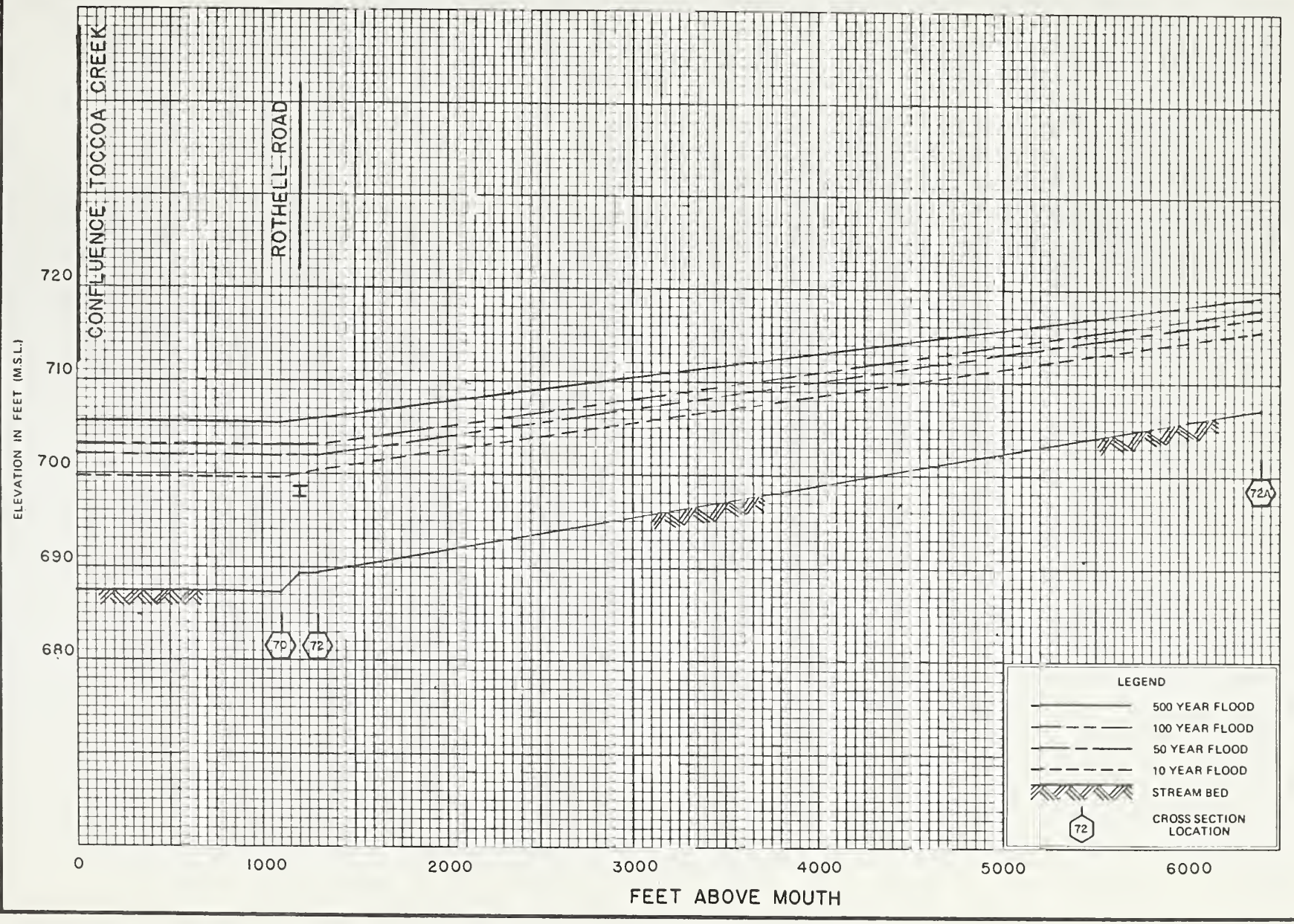
LITTLE TOCCOA CREEK

FLOOD PROFILES



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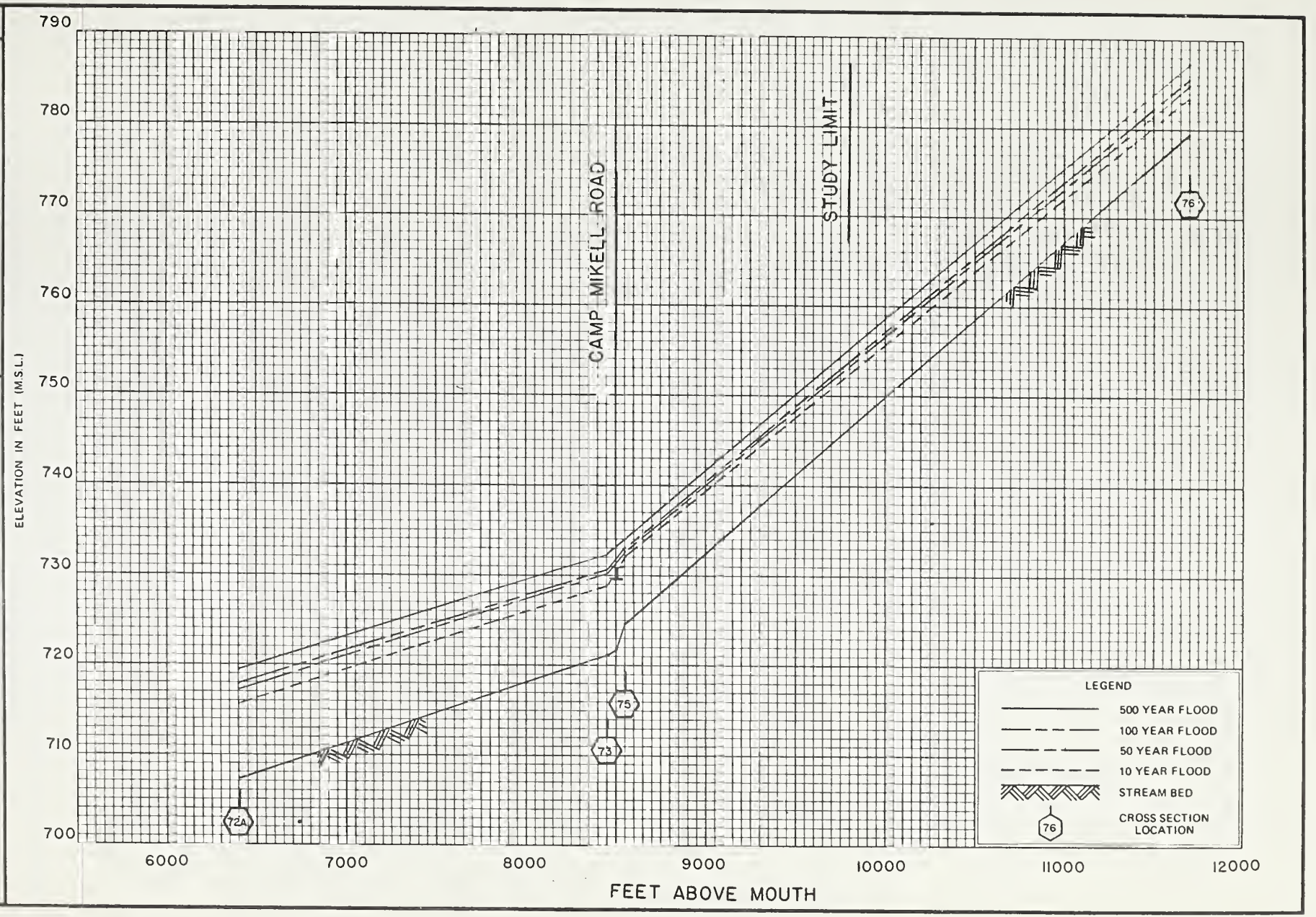

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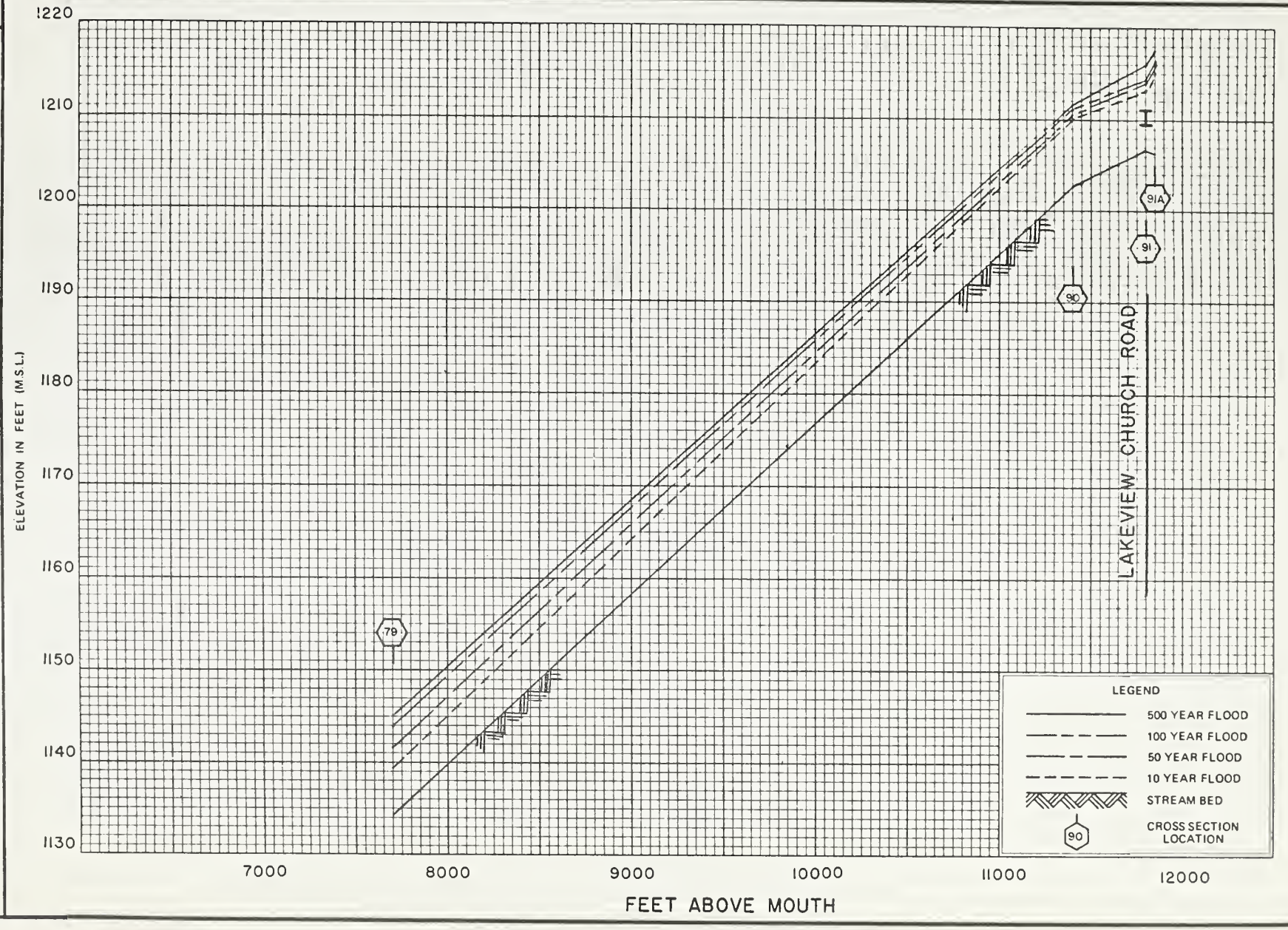
CEDAR CREEK



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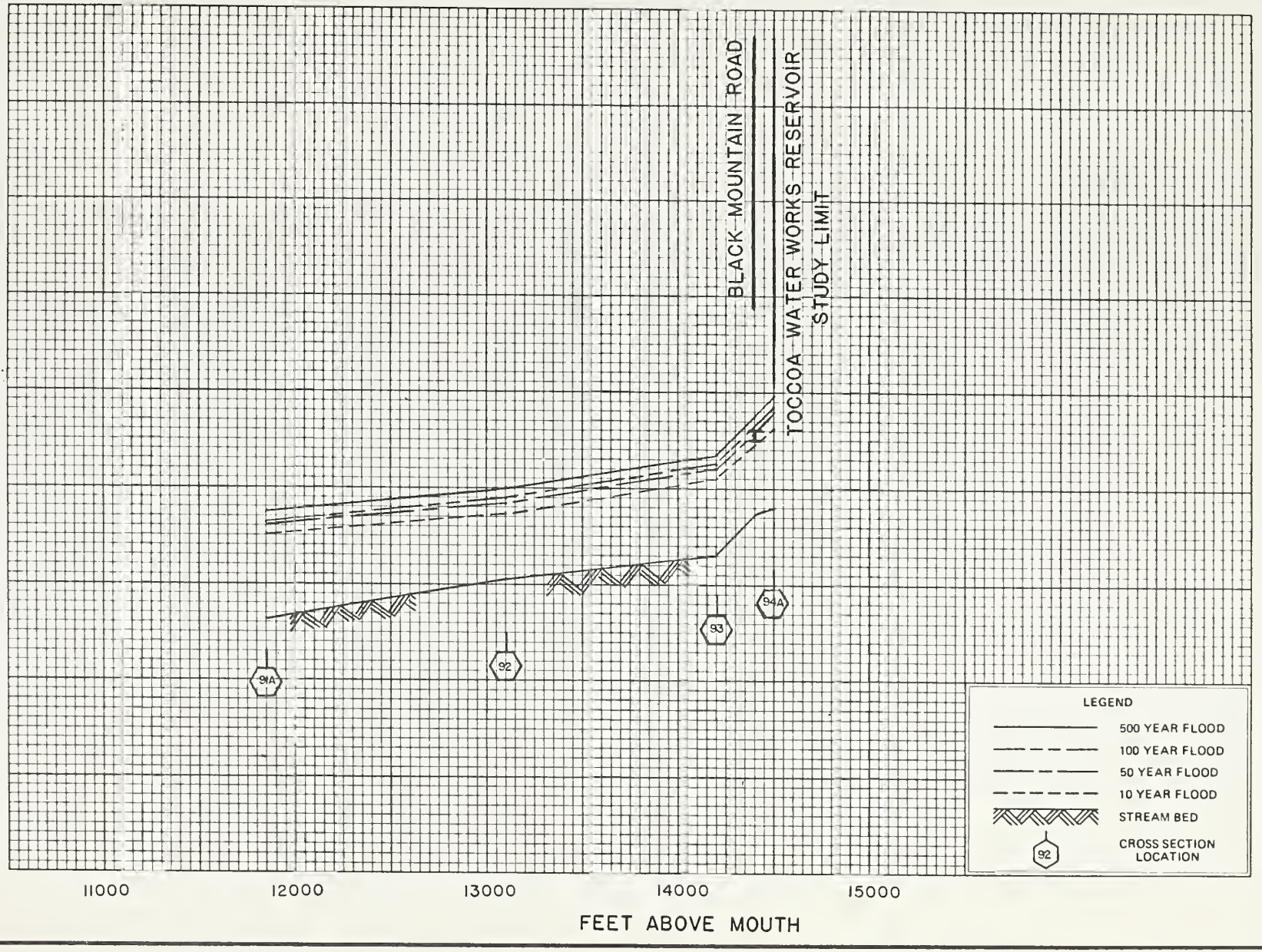
STEPHENS COUNTY, GEORGIA

CEDAR CREEK

FLOOD PROFILES



APPENDIX B

APPENDIX B

WATER SURFACE ELEVATIONS

Road or Cross Section	Distance (Feet)	Flood Peak Elevations (Feet,MSL) by Recurrence Interval (Years) 10	50	100	500
Eastanollee Creek					
Tower Road	0	704.2	705.5	706.9	710.0
6	3,400	711.3	715.6	716.8	719.6
9	12,600	750.9	752.3	752.9	754.7
12	22,600	783.6	788.5	789.7	792.7
15	28,500	829.8	833.9	834.7	836.5
18	37,700	853.1	856.3	856.8	858.2
Rose Lane	47,000	882.2	884.0	884.6	886.0
28	54,000	907.0	909.8	911.1	913.2
Tributary A					
Morgan Street	700	932.8	934.0	934.3	935.5
Little Eastanollee Creek					
Yow Mill Road	1,400	714.5	717.9	718.2	719.0
107	9,550	743.1	745.1	745.5	746.8
Oggs Branch					
112	1,750	837.3	839.8	840.7	843.4
Toccoa Creek					
40A	6,700	673.1	676.3	677.7	681.5
Ga. Highway 184	16,800	693.6	697.8	699.2	704.0
43B	22,100	703.2	705.0	705.8	708.4
46	25,550	716.1	719.8	720.7	723.1
49	35,550	782.7	788.3	789.3	790.8
Ga. Highway 17	40,000	802.9	804.4	804.8	806.2
61	45,800	844.6	846.9	847.9	850.4
Little Toccoa Creek					
72	1,300	700.3	702.0	703.1	706.0
75	8,550	732.2	732.8	733.1	734.1
Cedar Creek					
79	7,700	1139.6	1141.7	1144.0	1145.1
91A	11,850	1215.1	1216.0	1216.4	1217.6
93	14,200	1221.1	1222.0	1222.5	1223.6

SUMMARY OF DISCHARGES

Flooding Source and Location	Drainage Area (sq.mi.)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Eastanollee Creek					
Tower Road	21.7	5,080	9,400	11,800	20,000
Yow Mill Road	15.7	4,080	7,560	9,540	16,150
Hayes Road	13.5	3,680	6,810	8,560	14,500
Scott Road	11.3	3,250	6,020	7,560	12,800
Ga. Highway 17	10.0	2,990	5,530	6,950	11,800
Meadowbrook Drive	5.5	1,920	3,560	4,470	7,600
Rose Lane	3.4	1,330	2,450	3,080	5,230
Collier Road	1.9	820	1,520	1,920	3,250
Collins Road	0.6	410	760	950	1,600
Tributary A					
Morgan Street	0.4	310	570	720	1,220
Little Eastanollee Creek					
Yow Mill Road	5.0	1,790	3,320	4,180	7,070
Hayes Road	3.7	1,390	2,570	3,230	5,470
Oggs Branch					
Ga. Highway 17	2.3	970	1,790	2,250	3,810
Toccoa Creek					
Ga. Highway 184	26.2	5,740	10,600	13,400	22,600
Highview Road	12.9	3,580	6,620	8,320	14,100
Ga. Highway 17	8.4	2,640	4,880	6,140	10,400
Toccoa Falls Drive (at Falls)	7.6	2,450	4,540	5,710	9,670
Little Toccoa Creek					
Rothel Road	10.9	3,180	5,880	7,400	12,500
Camp Mikell Road	9.3	2,840	5,250	6,610	11,200
Cedar Creek					
Cross Section 79	3.2	1,260	2,340	2,940	4,980
Lakeview Church Road	2.8	1,140	2,100	2,650	4,480

FLOODWAY DATA

Flooding Source		Floodway			100-Year Flood Water Surface Elevation		
Section	Distance[1] (Feet)	Width (Feet)	Section Area (Sq.Ft.)	Mean Velocity (F.P.S.)	With Floodway (M.S.L.)	Without Floodway (M.S.L.)	Difference (Feet)
Eastanollee Creek							
3	200	679	7,142	1.6	707.9	706.9	1.0
4	3,300	61	863	11.1	715.4	714.4	1.0
7	12,400	322	1,780	4.8	751.8	750.8	1.0
12	22,600	137	1,740	4.3	790.7	789.7	1.0
13	28,100	411	3,672	1.9	833.3	832.3	1.0
16	37,500	144	993	4.5	855.6	854.6	1.0
21	46,850	53	406	7.6	884.8	883.8	1.0
28	54,000	109	662	2.9	912.1	911.1	1.0
Little Eastanollee Creek							
100	800	223	1,618	2.6	712.2	711.2	1.0
107	9,550	302	1,929	1.7	746.5	745.5	1.0
Oggs Branch							
112	1,750	227	1,154	2.0	841.7	840.7	1.0
Toccoa Creek							
40A	6,700	300	3,166	4.4	678.7	677.7	1.0
43	16,950	1,114	15,693	0.8	701.6	700.6	1.0
43B	22,100	408	2,684	3.1	706.8	705.8	1.0
49	35,550	234	2,724	2.4	790.3	789.3	1.0
53	40,850	93	882	6.5	813.3	812.3	1.0
Little Toccoa Creek							
72	1,300	600	3,465	2.1	704.1	703.1	1.0
Cedar Creek							
79	7,700	38	302	9.7	1145.0	1144.0	1.0
90	11,400	128	445	6.0	1212.1	1211.1	1.0

1/ From mouth or downstream study limit.

APPENDIX C

APPENDIX C

INVESTIGATIONS AND ANALYSES

Survey Procedures

Vertical control was established along stream courses studied using mean sea level datum. Approximately 120 road, bridge, channel, and valley cross sections were surveyed using a telescopic alidade. About 50 elevation reference marks (bench marks) were established. These are listed and described in Appendix E. Distances between cross sections were scaled from aerial photography. Surveys were completed in April 1981.

Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for floods of the 10-year, 50-year, 100-year, and 500-year recurrence intervals. These discharges are based on statistical analysis of discharge records covering a 45-year period at the Panther Creek gaging station operated by USGS. This analysis followed the standard log-Pearson Type III method as outlined by the Water Resources Council's Bulletin No. 17A, Revised June 1977. Panther Creek gage has a drainage area of 32.5 square miles, and is located approximately 8 miles north of the study area. It is judged to be hydrologically and geologically similar to the study area. It also has the highest peak discharges of all stations in the region.

Panther Creek station discharges were translated to the drainage areas of Toccoa and Eastanollee Creeks by procedures given in SCS Engineering Handbook, Section 4 - Hydrology.

Hydraulic Analyses

Elevation-discharge relationships were established using the SCS's water surface profile computer program WSP-2. The solution consists of back-water computations based on Bernoulli's equation for the total energy at each cross section and Manning's formula for the friction head loss between cross sections. Manning's roughness coefficients ("n" values), which represent the characteristics of the channel and overbank areas, were based on field reconnaissance.

The rise in water surface elevations at road crossing structures was computed for the following conditions: open channel flow, pressure flow, weir flow, or any appropriate combination. In making computations, unobstructed bridge flow conditions were assumed. No consideration was made for openings blocked by debris, future flood plain filling, or other encroachments which could increase flood stages.

The delineated flood hazard area limits are the irregular lines conforming to the area subject to inundation by the 100-year and 500-year floods as shown on photomaps in the report. The floodway has been computed by making equal conveyance reductions on each side of the channel for the 100-year flood, until either the channel bank was reached or the water surface elevation was increased by 1.0 foot. This was done by use of the floodway computer program.

Floodway widths at selected cross sections are tabulated in Appendix B.

Natural Values

The 100-year flood plain as described in this study was the base for evaluation of natural resources present.

Detailed study of natural resources and their related values was not conducted. A general field reconnaissance and literature search were conducted. Literature search provided some specific information for this study. Field reconnaissance was made in conjunction with current aerial photos, soil maps, and U.S. Geological Survey guadrangle maps to describe typical plant communities and stream and flood plain habitats. This information should be used only to point out areas where additional surveys should be conducted before an area is developed.

GLOSSARY OF TECHNICAL TERMS

Cross section (stream or valley) -- The shape of a channel, stream, or valley, viewed across the axis. In this study it is determined by a line approximately perpendicular to the main path of water flow, along which measurements of distance and elevation are taken to define the cross-sectional area.

Drainage area -- The area draining into a stream at a given point. The area may be of different sizes for surface runoff, subsurface flow, and base flow, but generally the surface runoff area is used as the drainage area.

Flood -- In common usage, an event where a stream overflows its normal banks. In frequency analysis it means an annual flood that may not overflow the banks.

Flood crest -- The maximum stage or elevation reached by the waters of a flood at a given location. The discharge at this stage would be the peak discharge.

Flood plain -- The areas adjoining a river, stream, watercourse, ocean, lake, or other body of standing water that have been or may be covered by floodwater.

Flood hazard area -- Same as flood plain.

Flood profile -- A graph showing the relationship of water surface elevation to location, the latter often expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood.

Frequency or recurrence interval -- A measure of how often a hydrologic event of given size or magnitude should, on an average, be equaled or exceeded. For example, a 100-year frequency flood should be equaled or exceeded in size, on the average, once in 100 years. However, this event could take place during any year. In terms of percent chance, this event is called the 1 percent chance flood, and has a 1 percent chance of occurring in any given year.

Mesic -- Refers to environmental conditions that have medium moisture supplies rather than wet or dry conditions.

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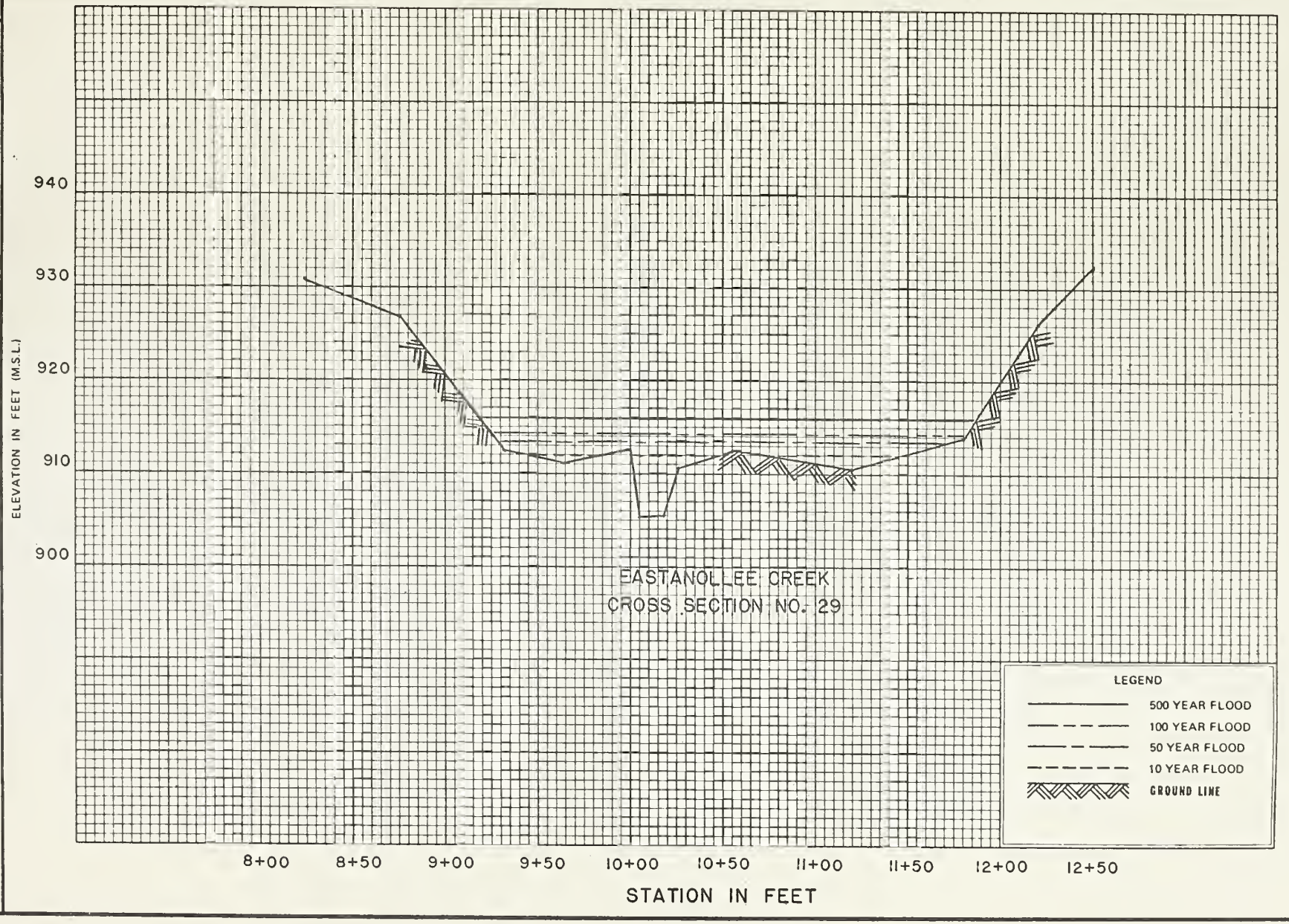
APPENDIX D

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TOCCOA AND EASTANOLLEE CREEKS
FLOOD PLAIN MANAGEMENT STUDY
STEPHENS COUNTY, GEORGIA

FLOOD PROFILES

TYPICAL CROSS SECTION



APPENDIX D

APPENDIX E

ELEVATION REFERENCE MARKS
(Bench Marks)

Identification	Elevation (Feet, Mean Sea Level)	Description
PBM 1	847.95	On Toccoa Falls College Campus at first road crossing (Toccoa Falls Drive) on Toccoa Creek downstream from Toccoa Falls. Chiseled square on top of NE corner of concrete culvert.
PBM 2	812.89	Chiseled square on SW wingwall of concrete box culvert at Toccoa Falls Drive crossing on Toccoa Creek behind Stephens County Hospital.
PBM 3	811.88	Chiseled square on NE wingwall of Georgia Highway 17 bridge over Toccoa Creek.
PBM 4	793.90	Center of manhole cover at edge of yard of Allen residence at end of Green Valley Drive about 40 feet N of north bank Toccoa Creek.
PBM 5	784.23	Chiseled square on NE corner of bridge runner at Scenic Drive crossing on Toccoa Creek.
PBM 6	716.83	Chiseled square on SE wingwall of concrete box culvert at High View Road crossing on Toccoa Creek.
PBM 8	702.35	Chiseled square on top SW wingwall of bridge at Georgia Highway 184 crossing on Toccoa Creek.
PBM 9	887.41	Chiseled square on top of concrete well 75 feet downstream from box culvert at Rose Lane crossing on Eastanollee Creek. Well is on east bank of creek.
PBM 10	745.08	Chiseled square on NE corner of concrete culvert at Hayes Road crossing on Little Eastanollee Creek.
PBM 11	872.59	Chiseled square on SW corner of concrete culvert on North Avenue crossing on Oggs Branch.
PBM 14	932.05	Chiseled square on NE corner of concrete culvert at Collins Road crossing on Eastanollee Creek.

Identification	Elevation (Feet, Mean Sea Level)	Description
PBM 15	911.91	Chiseled square on top of concrete guardrail on E side of bridge at Collier Road crossing on Eastanollee Creek.
PBM 16	828.24	Chiseled square on N end of headwall of bridge at Old Mill Road crossing on Eastanollee Creek.
PBM 17	1276.05	Georgia DOT BM ZMK 1975 BV-127-201. Bronze disc in concrete 60 feet SE of "T" intersection and 4 feet NE of utility pole.
PBM 18	1269.814	Geodetic Survey BM JWM 48-1950-1270. Toccoa, 2.8 miles NW of Southern Railway Station along Georgia Highway 17, thence 0.4 mile N along county paved road; 1.4 miles SE of Old Toccoa Church; 70 feet S of crossroads; 7 feet NE of telephone pole. Concrete post with tablet inscribed JWM 48-1950-1270.
PBM 22	855.55	Chiseled square on top NW headwall of concrete bridge at Meadowbrook Drive crossing on Eastanollee Creek.
PBM 23	842.18	Chiseled square on top of SW wingwall of bridge at Georgia Highway 17 crossing on Oggs Branch.
PBM 25	785.78	Chiseled square on SW corner of wingwall of bridge at Scott Road crossing on Eastanollee Creek.
PBM 26	749.11	Chiseled square on top of wingwall on SE end of bridge at Hayes Road crossing on Eastanollee Creek.
PBM 27	708.62	Bolt head in top walkway on SE corner of concrete bridge at Tower Road crossing on Eastanollee Creek.
PBM 30	1236.04	Concrete post 3 feet E of utility pole on north side of Black Mountain Road. Post is 100 feet S of south end of Toccoa Reservoir spillway.
PBM 31	901.92	Concrete post 3 feet from utility pole located 20 feet from edge of pavement on west side of Andrews Drive at 90-degree bend in road.

Identification	Elevation (Feet, Mean Sea Level)	Description
PBM 32	921.79	Concrete post 21 feet from east bank of Eastanollee Creek and 1 foot from manhole cover off Morgan Street.
PBM 33	897.26	Concrete post in front of brick house on west side of Buena Vista Drive, approximately 1,800 feet from Georgia Highway 145.
PBM 35	842.49	Concrete post off Wolfpit Road behind Scott Gunter residence. On west bank of Eastanollee Creek, 150 feet from power line.
PBM 36	771.18	Concrete post located on north edge of field road behind residence of T. Scott. Post is 300 feet north of north bank of Eastanollee Creek and 4 feet from twin oak tree on north side of field road.
PBM 38	711.54	Concrete post on north bank of Little Eastanollee Creek and east side of Yow Mill Road at the wood bridge. Post is 3 feet from a sweetgum tree on the north creek bank.
PBM 39	1157.14	Concrete post off Long Road at Henderson Cottage, approximately 30 feet west of 18-inch diameter white oak tree at end of driveway.
PBM 40	729.21	Concrete post in front of Albert Simmons residence, 3 feet from utility pole at junction of Camp Mikell Road and Rothell Road.
PBM 41	731.29	Concrete post on south side of Camp Mikell Road approximately 100 feet west from west end of bridge over Little Toccoa Creek.
PBM 43	851.74	Concrete post 10 feet west of west bank of Oggs Branch at cross section 113.
PBM 46	768.90	From Georgia Highway 17 South, left turn on Hayes Road, then 0.2 mile to driveway on left. Along driveway to farm house, then along field road to Eastanollee Creek. Concrete post is located 800 feet upstream from edge of pasture and 15 feet east from east bank of Eastanollee Creek.

Identification	Elevation (Feet, Mean Sea Level)	Description
PBM 47	861.78	From intersection of Georgia Highway 145 and Meadowbrook Drive, north on Meadowbrook Drive 0.15 mile to Industrial Park Road; thence west on Industrial Park Road 0.25 mile to dirt road on left. Proceed on dirt road 0.2 mile. Concrete post on east side of road 80 feet south of south bank of Eastanollee Creek.
PBM 48	1217.80	Nail head in center of chiseled "X" on NE corner of concrete box culvert at Lakeview Church Road crossing on Cedar Creek.
PBM 49	945.18	Top of iron rod inside chiseled square on top of concrete guardrail of concrete culvert at Davis Avenue crossing of Eastanollee Creek.
SC 5	721.20	Nail and tag in 10-inch diameter pine tree 40 feet east of east bank of Little Eastanollee Creek.
SC 12	911.69	Nail and tag in 12-inch diameter pine tree approximately 40 feet east of east bank of Eastanollee Creek.
SC 13	918.87	Nail and tag in 18-inch diameter pine tree approximately 30 feet east of east bank of Eastanollee Creek.
SC 15	890.46	Nail and tag in utility pole No. 6 in pasture about 200 feet NE of northeast bank of Eastanollee Creek.
SC 17	832.17	Nail and tag in crooked 4-inch diameter sweetgum tree at edge of field about 300 feet west of west bank of Eastanollee Creek.
SC 21	753.01	Nail and tag in 24-inch diameter poplar tree on east bank of Little Eastanollee Creek at edge of pasture.
SC 22	1274.42	Nail and tag in 12-inch diameter pine tree on north side of Long Road about 30 feet from driveway to Henderson Cottage.

Identification	Elevation (Feet, Mean Sea Level)	Description
SC 26	735.69	Nail and tag in 12-inch diameter water oak tree at edge of pasture and toe of hill. About 30 feet north of woods road and 250 feet northeast of Eastanollee Creek.
SC 27	731.19	Nail and tag in 14-inch diameter hickory tree on north bank of Davis Road about 100 feet from junction with Yow Mill Road.
SC 28	935.14	Chiseled square on top of northeast corner of concrete culvert at Morgan Street crossing on Tributary A.
SC 30	765.67	Nail and tag in 18-inch diameter oak tree growing into 24-inch maple tree located 15 feet from east bank of Toccoa Creek.
SC 31	751.29	Nail and tag in 20-inch diameter sycamore tree on northwest bank of Toccoa Creek.
SC 32	665.73	Nail and tag in 18-inch diameter water oak tree on east bank of Toccoa Creek.
TBM 40	740.82	Nail and tag in utility pole on north bank of Little Eastanollee Creek at cross section 104.
TBM 41	767.43	Nail and tag in 24-inch diameter poplar tree on north bank of Little Eastanollee Creek at cross section 109.
TBM 53A	823.51	Nail (40 d) and tag in utility pole at Toccoa Falls Elementary School.
TBM 63	694.22	Nail and tag in 6-inch diameter poplar tree in group of six poplar trees on fence line about 350 feet north of north bank of Toccoa Creek.
TBM 68	701.39	Nail and tag in 10-inch diameter walnut tree on north bank of Toccoa Creek.
TBM 69	718.21	Nail and tag in root of 14-inch diameter maple tree on top left creek bank (looking downstream).
UE 1	832.98	Chiseled square on northwest end of bridge at Georgia Highway 17 crossing on Eastanollee Creek.